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COMPUTERWORLD

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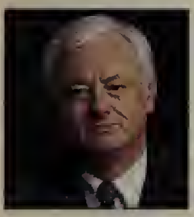

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Windows clouds Apple advantage, with expected 3.0 release likely to mirror much of the Macintosh's interface abilities. Page 35.

Glitzy graphics and hefty price cuts underline DEC's determination to grab a leading share of the workstation market. Page 4.

Lotus/Novell merger aims at Microsoft

BY PATRICIA KEEFE
and JIM NASH
CW STAFF

CAMBRIDGE, Mass. — Unwilling to face the 1990s as a one-trick pony, Lotus Development Corp. stunned the industry last week by announcing its intent to purchase its networking counterpart, Novell, Inc.

The merger was immediately tagged as both a response to the Microsoft Corp. juggernaut and as recognition by Lotus of the need to better align systems software with applications development. Both companies have been saddled with reputations as one-product companies.

Lotus founder Mitch Kapor, who left the company nearly four years ago, said the merger could "represent a significant challenge to Microsoft's complete dominance of systems software."

It is also expected to bolster the so-far anemic client/server thrust of both Lotus and Novell.

Surprised users said they expected the merger to improve Lotus' networking capabilities (see story page 108).

Analysts last week saw potential for synergy but also said that the two vendors will have to resolve a number of differences, not the least of which is a dramatic clash of business styles. Otherwise, Novell is expected to give Lotus a big hand with its recent focus on service, support and consulting services.

The industry was largely caught off guard. However, Craig Burton, formerly Novell's chief strategist, said Novell has been on Lotus' acquisition list for the past two years. Jim Tolonen, Novell's chief financial officer, said serious negotiations gelled "only in the last two months."

Reaction from Novell competitors was subdued.

"It's a total surprise to me," said Bob Metcalfe, founder and executive vice-president at Novell rival 3Com Corp. Downplay-

Continued on page 108

3Com misdeals own plan

BY PATRICIA KEEFE and JIM NASH
CW STAFF

SANTA CLARA, Calif. — In a move that would have pleased many Wall Street analysts as well as some 3Com Corp. investors, the networking firm came within hours two weeks ago of unveiling a new president — Rolm Corp. founder Kenneth Oshman — as well as the acquisition of Echelon Corp., headed by Oshman.

An unpublished press release on 3Com stationery, dated March 29, said that as part of the deal, William Krause, 3Com's chairman, chief executive officer and president, was to have

Continued on page 108

Attention mainframe users: Vendors have a deal for you

BY ROSEMARY HAMILTON
CW STAFF

When Thomas Loane set out to buy a new mainframe from IBM last fall, he made sure that IBM knew he had a competing proposal from a leasing company in hand. According to Loane, that proposal proved to be a nice negotiating tool. While he kept his purchase price confidential, he said his deal included such freebies as software, educational services and on-site installation assistance.

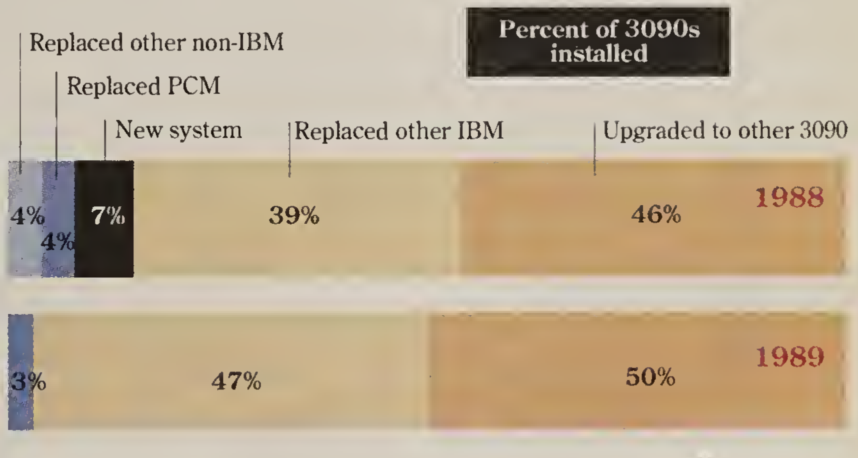
Loane, who heads information systems at Alamo Rent-A-Car, Inc., has a story that is apparently not unique.

Put in simple terms, a shift in power is under way in the mainframe market, where the customer can now rule and the vendors — IBM and its two chief

Continued on page 106

Preaching to the converted

Installation data indicates that IBM 3090 systems are increasingly replacing older 3090s or other IBM mainframes



Source: Computer Intelligence

CW Chart: John York

Bankamerica's CIO jumps ship — again

BY CHARLES VON SIMSON
CW STAFF

SAN FRANCISCO — Lured by broader responsibilities at a smaller company, Michael Simmons, executive vice-president of Bankamerica Corp.'s systems engineering division, will leave his current position to head all operations and technology at the struggling Bank of Boston.

Bank of Boston announced last week that Simmons will take over as the bank's group executive vice-president for technology and operations starting May 1. The job, a general management staff position, includes responsibility for all six technology groups within the $40 billion bank holding company as well as facilities management, security and procurement and supply. Simmons will report directly to Bank of Boston Chairman and Chief Executive Officer Ira Stepanian.

John Owens

Simmons *heads to Bank of Boston*

The position Simmons leaves vacant is one of the most prominent and volatile jobs in corporate information systems and has both made and scuttled careers. While Simmons goes on to a senior management position at one of the nation's largest banks, his predecessor, Lou Mertes, now MIS director at Lincoln National Corp., was pressured to resign in October 1987 after the bank's

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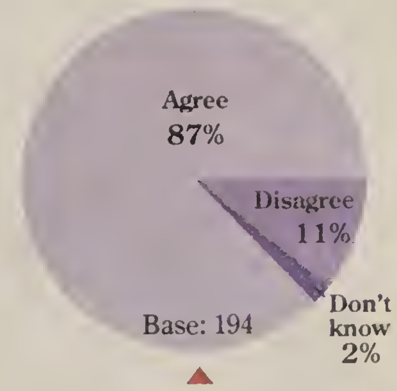
Inside

CASE value

BUYERS' SCORECARD

"The benefits from your use of front-end CASE tools have been worth the investment."



Respondents to this week's Buyers' Scorecard survey believe that their use of front-end CASE tools is paying off. For ratings of specific products, see page 68.

NEWSPAPER

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Quotable

"We try to squeeze the hell out of them."

GEORGE SEKELY
CANADIAN PACIFIC

On dealing with mainframe suppliers. See story page 1.

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From *5th Generation Management,* by Charles Savage: 'Many companies are hitting the organizational wall. They have trouble absorbing more computer-based technology. Could it be we are putting fifth-generation technology in second-generation organizations? . . . We are locked in a constellation of assumptions, principles and values — our inheritance from the industrial era — that hobble our efforts and keep us bottled up in traditional modes of behavior . . . It makes little sense to put vast amounts of money into technology with only a pittance for our people and organizations. Yet this is exactly what we are doing.'

Tricks for turning user-frogs into princes. Page 81.

Ralph Finn Hestoft

Tired of being at the mercy of minicomputer reliability, the American Bar Association's Jay Ammerman turns to PC LANs. Page 37.

EXECUTIVE BRIEFING

■ **They call it a merger,** but Lotus actually agreed to buy Novell last week in a stock swap that will create a formidable competitor to Microsoft. The deal will give Lotus a foot in the systems software door and control of the largest LAN standard. Users were upbeat about the union, although some worried that development and support could be put on ice while details are worked out. **Page 1.**

■ **Talk is cheap, advice is plentiful** in the lurching CASE market. The best real-life experiences are among commercial software developers, which are farthest along the CASE learning curve. These early implementors can talk about methodology vs. tools, how to rally the crowd and how to start planning for a CASE environment. If you're stuck on defining CASE terms, such as re-engineering and reverse-engineering, a glossary may help, as well as a summary of true re-engineering tools. **Page 61.**

■ **Better mainframe bargains are in the offing** as a result of fundamental shifts in the market. Slowing growth, a savvier customer base and plunging workstation prices are forcing big-iron makers to cut more attractive deals. Software and services are a popular throw-in. **Page 1.** Speculation is that IBM will not offer its usual 3090 performance kicker this year, further lowering prices. **Page 106.**

■ **DEC keeps pace** with IBM workstation offerings by rolling out seven RISC-based workstations and servers. The debut was accompanied by surprisingly deep price cuts on the existing RISC line. **Page 4.**

■ **The IRS gets a CIO,** but Henry H. Philcox has a job on his hands following further criticism of the agency's attempts to overhaul its systems. Philcox says the IRS is better prepared than ever to handle this year's tax load. **Page 6.**

■ **Now that thousands of firms** have committed to electronic data interchange, opportunities are arising for new EDI vendors — particularly those that show creativity by merging EDI offerings with other technologies such as tying data input software with EDI translation software. **Page 85.**

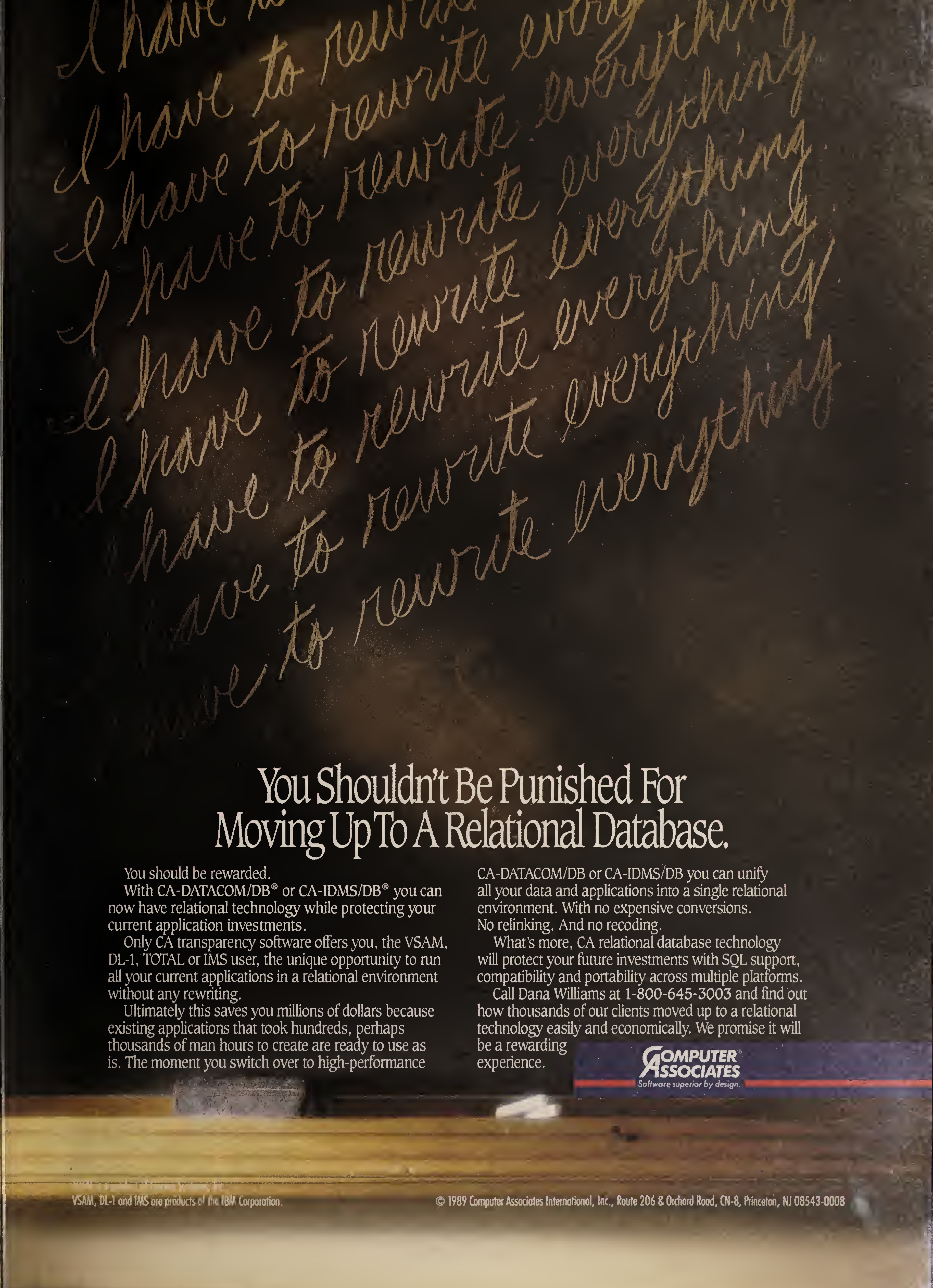
■ **Computer Associates** expects to add multimedia Help options to some of its products as early as this summer. Help messages could take the form of text, voice, video or all three. **Page 108.**

■ **The biggest headache** when it comes to handling database management from different vendors is not necessarily the idea of a mixed shop. The biggest challenge may be that of data administration because of different departments sharing data that was assembled under different rules. **Page 25.**

■ **Another Bank of America CIO defects** as Michael Simmons goes coast-to-coast to take a comparable position at Bank of Boston. Simmons takes over a smaller department but broader responsibilities. **Page 1.**

■ **Stratus bids for mainframe status,** unveiling 13 systems, including a high-end line priced at up to $9.1 million. Analysts like the price/performance but decry the lack of database software. **Page 6.**

■ **On-site this week:** The cure for a paper clot may be discovered in a new computer system, one dedicated to patient care, at the Hospital of St. Raphael in New Haven, Conn. **Page 27.** Being in a position to provide guidance to the legal profession, which is generally considered to lag behind leading-edge information technology users such as banking and insurance, the American Bar Association is making moves in its own IS shop, adding PC networks. **Page 37.** A group taking the lead in another field is NASA, which decided not to wait for standards to take shape and opted to base its network management system on the Simple Network Management Protocol. **Page 49.**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DEC plugs up workstation gaps

Offers graphics-rich Decstation, Decsystem and price cuts on existing systems

BY MARYFRAN JOHNSON
CW STAFF

PALO ALTO, Calif. — Digital Equipment Corp. filled in the gaping performance holes and shored up the graphics capabilities of its Unix-based computer line last week with the long-awaited debut of the Decstation and Decsystem 5000s.

Accompanying the announcement were surprisingly steep 25% to 40% price cuts on existing workstations and servers in DEC's reduced instruction set computing (RISC) line, which analysts estimated raked in slightly more than $1 billion in 1989 revenue.

"DEC is absolutely committed to continuing to play hardball with IBM in the price/performance war in the RISC-Unix market," said Peter Schay, an analyst at Gartner Group, Inc. in Stamford, Conn.

Gartner Group is now advising its clients to depreciate their RISC-Unix systems by at least 45% per year, which is double the ordinary system depreciation.

The major system and software highlights of the DEC announcement were the following:

- Four Decstation 5000 workstations, all sharing the same Mips Computer Systems, Inc. R3000 chip but varying in two- and three-dimensional graphics capabilities and priced from $14,995 to $51,000. All models are immediately available.
- Three Decsystem servers: the Model 200 "tabletop" server at $14,995; the Model 5830 three-processor server at $140,000; and the four-processor 5840 at $160,000. The 5800 models are field-upgradable from existing 5810s and 5820s and are available in June.
- A new version of the Ultrix operating system, DEC's version of AT&T's Unix System V, which includes symmetrical multiprocessing capabilities, improved personal computer integration and support for the industry-standard SQL integrated runtime database.
- Extended networking abilities that enhance support of wide-area networks and additional communications protocols such as Open Systems Interconnect and X.25, plus a new version of Decnet-Ultrix that permits communication between DEC machines and any other computers using the Transmission Control Protocol/Internet Protocol.

Does all of the above bring DEC nose-to-nose with IBM's new RISC line of Powerstations and Powerservers? The answer from industry analysts and some customers was a qualified "Yes."

"I've seen the 5000 machine perform, and it is impressive," said Robert Grandle, a systems manager at the National Aeronautics and Space Administration in Langley, Va. Grandle has run beta-test software on an IBM RISC System/6000 in his shop, which also has several Decstation 3100s running applications in computational fluid dynamics.

"I'm putting some purchase requests into the marketplace now, and I'm guessing it will be filled by either IBM or DEC," he said. "It depends on which of the two has the sharpest pencil."

Roll 'em out

DEC's line of Decstation 5000 workstations begins with the Model 200CX, which is complemented by powerful servers

Decstation 5000 Model 200CX
MIPS: **24**
Memory: **8M-120M bytes**
Storage: **Diskless to 21G bytes**
Base price: **$14,995**

Decsystem 5830
MIPS: **48**
Memory: **64M-192M bytes**
Storage: **560M bytes-2.4G bytes**
Base price: **$140,000**

Decsystem 5840
MIPS: **62**
Memory: **64M-128M bytes**
Storage: **560M bytes-2.4G bytes**
Base price: **$160,000**

Source: Digital Equipment Corp.
CW Chart: John York

Robert Herwick, an analyst at Hambrecht & Quist, Inc., said the DEC machine equals or betters IBM's RS/6000 in everything but floating point co-processor performance.

DEC was credited with adding quality graphics features such as three-dimensional polygons, fill areas, 24-bit Z-buffers, depth cuing and color planes — the stuff of engineering dreams.

With increased memory size and storage capabilities, vastly improved graphics and faster disk access, DEC's new systems took a "really substantial jump in applications-level performance," Herwick said. And the addition of an open systems bus — the Turbochannel I/O interconnect — allows users to add memory in bigger chunks than ever before.

William Boyd, a systems manager at the National Center for Atmospheric Research in Boulder, Colo., plans to use a Decstation 5000 to offload applications running on his division's Cray Research, Inc. supercomputer — a task the first-generation Decstation 3100 was not quite up to performing. "Anything that gives us more raw computational speed, we need," Boyd said. "The RISC workstations have surprised us with their capabilities going beyond what DEC said they would."

One universal criticism of DEC's first-generation RISC machines was the lack of applications, but the company addressed that issue by trotting out some 850 applications now available on its RISC line. New packages are being added at the rate of 100 per month, DEC claimed.

Court of Appeals not slamming doors on Bells

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A federal appeals court last week slightly opened the door that blocks the regional Bell holding companies from offering digital information services. Industry watchers said the ruling may spawn a host of new services and push down prices, but not any time soon.

A three-judge panel at the U.S. Court of Appeals overturned part of a 1987 ruling by U.S. District Judge Harold Greene that prohibits the Baby Bells from providing information services, manufacturing telecommunications equipment and providing long-distance telephone services. Greene presided over execution of the 1982 consent decree that broke up the AT&T monopoly.

The appeals court upheld the bans on manufacturing and long distance, but it said Greene applied a section of the consent decree that would have been appropriate only if the parties to the decree — AT&T, the regionals and the Justice Department — opposed lifting restrictions on information services. Those parties did not at the time oppose removing the ban.

The Bell companies can only be barred from offering information services if doing so "would be certain to lessen competition," according to the appeals judges.

Greene's 1987 ruling bars the generation of information by the regional Bells but not its transmission through local gateways provided by the companies. In essence, it says they can provide the medium but not the message.

That could change after Greene responds to the higher court's decision. "You'll see home shopping and other home services like banking, travel reservations and ticketing," predicted Gary Arlen, president of Arlen Communications, Inc., a research organization based in Bethesda, Md., that specializes in interactive information services.

"This is clearly very encouraging for the regionals. I'm betting there is now enough competition in the industry that the [regional Bells] will be into information services within two years," Arlen said.

He estimated the current information services market at $2 billion with a growth rate of 20% to 30% annually.

In addition to having a wider choice of electronic offerings, Arlen said businesses and consumers will benefit from the price pressure that increased competition will bring.

However, an industry source representing telecommunications manufacturers disagreed. "It's more likely to mean market disruption than lower prices or new services," the source said. The regionals may use accounting tricks that will enable them to siphon off revenues from ordinary telephone services to subsidize initially unprofitable information services, according to the source.

Ken Allen, senior vice-president of Information Industries Association in Washington, D.C., said: "Our position is that the Bells will be in the information services business some day, but they shouldn't be in it now — not until safeguards are in place ensuring equal access to the networks."

For better or worse, the issue seems unlikely to be resolved soon. Appeals of last week's decision are possible from any number of the many parties to the case, and Greene may choose to invoke another round of hearings.

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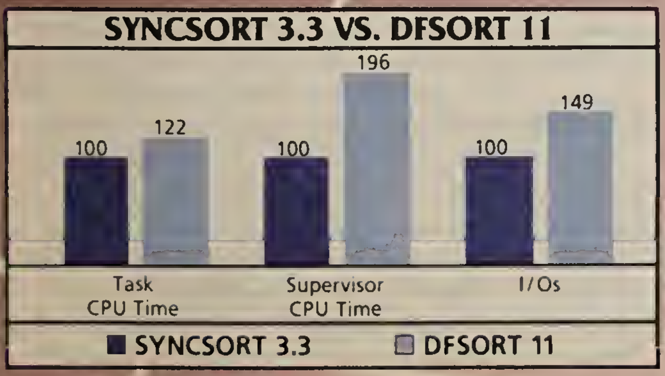

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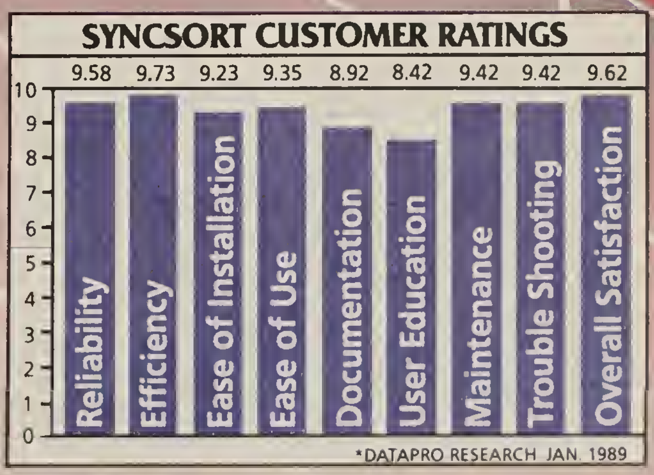

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Stratus seeks mainframe status for XA2000 line

BY MARYFRAN JOHNSON
CW STAFF

MARLBORO — Stratus Computer, Inc. strutted out 13 new additions to its fault-tolerant computer line last week, declaring it was time for the company to be taken seriously as a mainframe-class vendor.

The Marlboro, Mass.-based company introduced four multiprocessor systems at the top end of its XA2000 line, priced from $2.4 million to $9.1 million and containing up to 48 duplexed processor boards. The systems can handle massive critical online processing jobs at "a fraction of the cost" of traditional mainframes, Stratus said.

Stratus also doubled the power and performance of its current Series 100 with seven new models in the Series 200, priced from $225,000 to $1 million. In addition, it added two midrange systems — the $94,000 Model 75 and $194,000 Model 85.

On the same day, IBM, which resells the Stratus box under its System/88 label, announced a host of virtually identical systems but ignored the four "mainframe-class" models Stratus is apparently aiming at IBM turf.

Stratus is positioning the four top-end systems as competitors against Tandem Computers, Inc.'s Cyclone systems, IBM's 3090 mainframes and Digital Equipment Corp.'s mainframe VAX 9000 — a posture that some industry analysts said may be wishful thinking.

Stratus is still months away from offering multiprocessing versions of relational databases from Oracle Corp. and Sybase, Inc. on its systems, although uniprocessor versions of those databases have run on the machines for years.

"Where they understand the problems of their customers, Stratus will do very well," said Paul Zorfass, an analyst at The Yankee Group in Boston. "It's not clear whether they really understand all the data management issues or systemwide concerns of a large mainframe shop."

"Stratus is not giving an adequate picture of performance against industry benchmarks," said George Weiss, an analyst at Gartner Group, Inc., based in Stamford, Conn.

To defend its claim to mainframe-class performance, Stratus presented its own private benchmark, derived from a multiple-transaction customer application running at First Boston Corp. on the Series 200. By extrapolating the test results upward through its mainframe-class systems, Stratus claimed 883 transaction/sec. on the Model 2860.

"We aren't telling customers to throw out their existing mainframes," said Bill Elliott, Stratus vice-president of strategic planning. "But we are showing them how even our largest systems can connect with, offload and leverage their existing mainframes."

Both the high-end Series 200 and the mainframe-class systems are based on the Motorola, Inc. 68030 chip, which was threatened two weeks ago with discontinued sales in a legal battle with Japan's Hitachi Ltd. (see story page 7). The sales ban was lifted pending appeal.

For customers such as Envoy Corp. in Nashville, the Series 200 provides a much-needed growth path beyond Stratus' former high-end Model 160.

"We're growing so fast, we keep having to buy new computers," said James Kever, executive vice-president of Envoy, which offers processing and funds transfer services.

For users such as Angelo Casciato, data processing manager at Dahlkemper's retail headquarters in Erie, Pa., moving to the Series 200 is far too expensive for his needs. "It's the same machine I have now, the only difference being the new Motorola chip," Casciato said.

Upgrading one of his Model 120s to a 220, for example, would cost $225,000 and would not quite double his transactions per second. An $85,000 upgrade within the Series 100, however, would more than double his transaction speed, Casciato said.

The midrange models are available now; the Series 200 and top-end machines will be available in May and June. Customers who bought Series 100 systems after October 1989 can move up to the Series 200 with a field upgrade and no cabinet change. Upgrading an older system, however, will require a complete box-swap, company officials said.

Minicomputer overdrive

Stratus joins the ranks of minicomputer vendors seeking to power up systems for the mainframe market

	Models 75, 80	Models 210, 220, 230, 240, 250, 260	Models 2260, 2460, 2660, 2860
Duplexed processors	1-2	1-6	12-48
Processor type	Motorola 68020 with 68881 coprocessor	Motorola 68030 with 68882 coprocessor	Motorola 68030 with 68882 coprocessor
Duplexed main memory	8M-32M bytes	8M-128M bytes (addressing for 256M bytes)*	64M-1G bytes
Duplexed disk storage	152M-4.7G bytes	152M-31.2G bytes	1.6G-249.6G bytes
Maximum communications lines	96	440	888-3,576
Operating systems	VOS, FTX, Pick	VOS, FTX, Pick	VOS
Base list price	$94,000-$194,000	$225,000-$1,070,000	$2,350,000-$9,100,000

*Will support 256M byte memory when 4M-bit DRAM technology becomes available

Source: Stratus Computer, Inc.

CW Chart: Marie Haines

First-ever CIO for IRS to be named

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Taking his commission at the time of year when taxpayers tend to associate the Internal Revenue Service with the plague, Henry H. Philcox is expected to be named the IRS' first chief information officer this week.

The selection of Philcox, who has held the position on an interim basis since October, comes on the heels of more criticism of the IRS from the U.S. General Accounting Office (GAO), which recently said the agency's mammoth project to overhaul its antiquated computer systems is marked by risk and uncertainty.

In an interview with *Computerworld*, Philcox expressed confidence in the IRS' approach and optimism about its outcome. "The IRS is better prepared to do this job than ever in its history. Progress in the past three years has caught us up," he said.

Partly in response to management problems, the IRS reorganized its headquarters staff last year, creating the CIO position. The objective was to make the IRS act more like a private enterprise; it was widely believed that the agency would hire a CIO from the private sector.

Philcox said a nationwide letter-writing campaign — backed by two headhunters — turned up a large number of applicants, which was then narrowed to nine contenders. The nine — two from industry and seven already in government posts — were interviewed by an IRS panel before Philcox got the nod.

Philcox said low federal pay was apparently not an obstacle to finding qualified applicants.

Longtime IRS-er

In any case, Philcox, 48, has had ample time to adjust to federal government pay scales. Armed with a bachelor's degree in accounting, he joined the IRS' Reno, Nev., office as a tax agent in 1967. He advanced through a variety of posts, making his systems debut as assistant regional commissioner for data processing for the Southwest region in 1984. He was appointed assistant commissioner for tax system redesign in 1986.

Recent performance of IRS systems has been uneven. Processing in 1985 was a near-disaster as the cutover to new mainframes and software caused major delays in processing returns and mailing refunds. But despite massive software changes dictated by tax law changes, the 1988 tax-processing season went so smoothly that the IRS won a rare pat on the back from the GAO [CW, Nov. 21, 1988].

However, the agency is finding it increasingly difficult to keep its aging systems — mostly 1960s-vintage batch systems literally surrounded by tons of magnetic tapes and paper — running smoothly. A year ago, a U.S. senator said the IRS systems were headed for a "train wreck" in the mid-1990s.

Philcox is working on a plan to head off the train wreck. He said the agency is nearing completion of its overhaul plan for an eight-year project that will cost between $5 billion and $6 billion [CW, April 10, 1989].

However, the GAO is not entirely happy with the progress being made. Its latest report said the IRS has not done the kind of detailed analysis needed to put together the master plan, due for completion this fall.

The GAO's concerns stemmed in part from lack of information about IRS plans, Philcox said.

Philcox said IRS computers are humming along relatively smoothly this year, with many of the 111 million expected returns already through the system. He said the number of returns filed electronically has jumped from 1.2 million last year to 3.8 million so far this year, partly because of a scale-up of that system to nationwide operations.

Bankamerica

FROM PAGE 1

$80 million Masternet on-line institutional trust accounting system crashed and crippled some of the bank's operations.

The 2,000-employee group at Bank of Boston is less than half the size of the 4,500-employee systems engineering department at Bankamerica. Simmons' expanded position replaces an informal horizontal management committee headed by Kavin Moody, former IS director at Gillette Co. and currently the bank's acting director of corporate information and technology, and Jack Martin, director of the company's regional Eagle Information Technologies Group. Moody and Martin will remain with the bank with the same titles while reporting to Simmons.

"I expect it to be a major challenge," Simmons said. "It is a broader role than [the Bankamerica] job, with responsibilities outside of data processing. The job description is closer to my ambitions. That was a major attraction."

An executive at Bankamerica close to the situation said that there was no one in place to succeed Simmons and that the executive search would be overseen directly by Richard A. Rosenberg, the announced successor to retiring Bankamerica Chairman A. W. Clausen.

Simmons' is the last appointment in a major housecleaning of the executive ranks at the Bank of Boston that included replacement of the chief financial officer and reorganization of many of the banking groups.

Simmons took the top IS job at Bankamerica in July 1988 after it had been vacant for about 10 months. He inherited the $80 million Masternet system debacle, lack of senior management confidence in IS and skyrocketing costs in the systems engineering division. At the same time, Bankamerica was suffering through one of the worst financial periods in its history.

He promptly ended the Masternet system's development and went on to stress cost control and increased efficiency, beginning few new infrastructural projects. According to peers, he enjoyed strong support from both retiring Chairman Clausen and Rosenberg during a time of remarkable financial recovery at the bank.

While he is leaving Bankamerica at a time of strong earnings growth, he is heading into a less rosy forecast in Boston. Simmons will join the Bank of Boston at a time of slowing growth in the New England economy and attendant problems at most regional banks. The Bank of Boston announced recently that it expects first-quarter revenue to fall below the same period a year ago.

Standoff brings no cheers from Motorola clients

Reprieve on 68030 ban doesn't resolve current, future jeopardy from Hitachi patent claims

BY JAMES DALY
CW STAFF

Motorola, Inc.'s stopgap reprieve of a court-ordered ban on sales of its 68030 microprocessor was small comfort to personal computer and workstation manufacturers that could not only lose access to the heart of their current systems but also see future upgrade plans scrambled.

Pending the completion of Motorola's appeal of the finding that it was guilty of infringing on Hitachi Ltd. patents, the ban has been lifted. But the potentially lengthy standoff between the companies is drawing heat in the industry, which is hoping for a quick settlement to one of the most dramatic high-tech disputes in recent history.

"It's like holding the winner at bay until the loser has a chance to get up off the mat," said Lane Mason, an analyst at Viking Research in San Jose, Calif. "I don't see the need for it."

However, a major breakthrough could come as early as tomorrow, when Federal District Judge Lucius D. Bunton III reviews Hitachi's motion to vacate the stay order Motorola was awarded only a day after the March 29 injunction halted 68030 shipments.

> "IT'S LIKE HOLDING the winner at bay until the loser has a chance to get up off the mat."
>
> LANE MASON
> VIKING RESEARCH

In the original ruling, Bunton ordered Motorola to stop marketing or selling the 68030 in the U.S. for the duration of the infringed Hitachi patent, while Hitachi officials received a similar directive concerning their H8/532 microcontroller, an embedded controller that the judge found to be in violation of Motorola-patented designs.

The move was seen as attempt to get both parties to the bargaining table. Although Hitachi Vice-President Yasushi Sayama declined to specify what options have been discussed outside the courtroom, reports of either a cross-licensing agreement or a monetary settlement have surfaced.

Sitting in limbo

If Bunton vacates the Motorola stay, the Schaumburg, Ill.-based company could have a gaping hole in its product line. The 68040 is available in sample quantities only, with production volume not expected until midyear. There is also a sharp price discrepancy between the two chips: The 040 sells for $795, while the 030 is priced at about $200.

Additionally, Motorola's next-generation 68040 incorporates some of the same design characteristics that are central to the 68030 dispute, according to Motorola spokesman Tim Kellogg.

Industry experts said a redesign could be a headache of monumental proportions. "It's almost like starting over," said Howard Dicken, editor of "Semiconductor Economics Report," an industry newsletter. "It would be a major undertaking, possibly involving tens of millions of dollars. Even changing a couple of transistors is tricky."

Such a redesign could also spark compatibility concerns from vendors that rely on the Motorola line. For now, manufacturers are keeping their fingers crossed. Next, Inc. spokeswoman Emily Brower said that although there has been "no discussion" of abandoning support for Motorola's line, "we're hoping they'll get this resolved very quickly."

Similar feelings were expressed at both Hewlett-Packard Co. and Apple Computer, Inc.

Observers said the likelihood of a quick resolution is high. "Both companies come out bad unless they do something in a hurry," said Drew Peck, an analyst at Donaldson, Lufkin & Jenrette. Additionally, Bunton has a reputation for quickly settling complicated legal issues; his nickname around the courtroom is "Rocket Docket."

The decision has far more dire consequences for Motorola than Hitachi. The 32-bit 68030 is the firm's best-selling product and is an integral part of computers produced by such heavyweights as Apple, HP, Sun Microsystems, Inc., NCR Corp., Next and Unisys Corp. But the H8 now accounts for only 1% of Hitachi's annual $3 billion semiconductor business and does not represent leading-edge technology, according to spokesman Osamu Naito.

The ruling comes after a long legal slugfest in which the two companies accused each other of stealing technology. At the root of the dispute is a 1986 cross-licensing agreement in which the two firms allowed each to use some of the other's technology. Both Motorola and Hitachi subsequently charged each other with stepping over the borders of that agreement.

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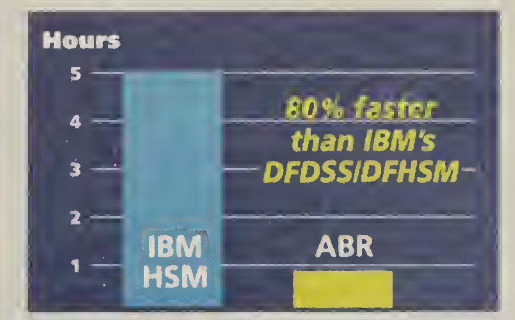

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NEWS SHORTS

Computer crime team born

Industry seldom reports computer-related crimes, and law enforcers seldom investigate them. Now there are efforts under way to foster cooperation between the camps through a newly formed High-Technology Crime Investigation Association. The group hopes to put law enforcers and information systems security people in the same room and informally trade information that may lead to more active investigation and prosecution of computer crimes. Chapters have been set up in California, New York and Michigan.

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IBM, Western Union tie E-mail users

According to a joint announcement between IBM and Western Union Corp., the firms intend to connect Western Union Easylink and IBM Screenmail electronic mail users using X.400 standards. Western Union said it already links its Easylink users to General Electric Information Services' and AT&T's E-mail networks via the Western Union 400 Service, an X.400 gateway. IBM said it has been testing links for Screenmail with a number of E-mail network providers and that the Western Union agreement is the first to be finalized.

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Airline set on $50 million plan

Northwest Airlines in St. Paul, Minn., is expected this week to disclose the details of a massive, $50 million image-management project at the Association for Information and Image Management show in Chicago. The project at the nation's fourth-largest airline reportedly involves the processing of 260,000 ticket images daily. Participants in the application include image management vendor Filenet Corp. in Costa Mesa, Calif., systems integrator Andersen Consulting and workstation maker Sun Microsystems, Inc.

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DEC offers ozone-safe cleaning info

Digital Equipment Corp. announced last week a technology that eliminates the use of ozone-depleting chlorofluorocarbon solvents in the process of cleaning printed circuit boards. DEC said complete technical information about the water-based cleaning process, developed at its plant in Augusta, Maine, will be provided free of charge to other electronics companies through the Industry Cooperative for Ozone Layer Protection.

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Financial industry cuts

Shearson Lehman Hutton, Inc.'s IS group took a painful hit late last month when the firm eliminated 133 positions, or about 20% of the entire development group. The layoffs were part of a corporate restructuring aimed at reducing Shearson's bloated ranks by 2,000. Since 1987, Shearson's IS group has shrunk by more than 900 employees. The most recent cuts came just days before the firm said it would post a $917 million loss for the first quarter, the largest ever in Wall Street history.

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And more cuts

The Bank of New England announced 1,700 layoffs last week in a corporate downsizing that will cut 5,600 jobs by the end of the year. A spokesman did not detail the impact on the bank's IS department but said "the job reduction was done equitably across all levels of management and staff." One worker in IS said as of Thursday there had been approximately 20 IS workers laid off, and another five had volunteered to leave. The bank, which said all affected workers will have at least 30 days notice and severance pay, is trying to trim $300 million in operating expenses after reporting a $1.1 billion loss for 1989.

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Covia lands in Japan

Travel reservations systems developer Covia Partnership said last week it has established a foothold in Japan. Covia Nihon Co., based in Tokyo, will market Covia's Apollo reservation system in Japan. Covia also said it had installed 31 workstations at the Osaka Institute of Tourism to train Japanese travel agents on Apollo, which serves 600 locations in Japan.

More news shorts on page 107

IS leader heads for Wharton

BY RICHARD PASTORE
CW STAFF

CAMBRIDGE, Mass. — Thomas Gerrity, president of Computer Sciences Corp.'s (CSC) consulting group and founder of information technology consultancy Index Group, Inc., last week resigned his post to accept an appointment as dean of the University of Pennsylvania's Wharton School.

Gerrity founded Index in 1969, building it into one of the most successful and respected consultancies serving senior executives on the strategic role of information technology.

"I hadn't contemplated any move," Gerrity told *Computerworld* last week. "I was surprised and flattered when I was contacted by the school."

"I'm very, very proud of everything we've built at Index and CSC," he added. "I'm sad to be leaving my colleagues and friends."

Gerrity was *'flattered and surprised' by the offer*

Gerrity said there will be no radical change in Index's agenda after his departure. A key focus for Index and CSC will continue to be the need to re-engineer old applications to run on more modern platforms.

Gerrity served as Index's chief executive officer until late 1988, when it was purchased by $1.3 billion professional service conglomerate CSC. Since then, Gerrity has served as president of CSC Consulting, charged with uniting the five companies (including Index) that make up the $250 million consulting group.

"We regret losing an executive of Tom's caliber," said William Hoover, chairman and president of CSC, who will temporarily assume Gerrity's duties. "At the same time, we are proud that Tom has chosen to lead one of the world's truly outstanding business schools."

This is not Gerrity's first foray into academia. Before starting Index, he was a professor and researcher at MIT's Sloan School of Management, where he pioneered the use of information technology by senior executives.

In his return to the scholastic world, Gerrity said he will be served by the valuable experience of seeing business issues and concerns through clients' eyes.

"The opportunity at Wharton is to have a positive impact on the field of management," he said.

The flap about AFIPS: 'Waterloo or watershed?'

BY PATRICIA KEEFE
CW STAFF

WASHINGTON, D.C. — Has AFIPS breathed its last? Or is it merely on the verge of reincarnation?

A meeting was slated for last Saturday to decide whether to allow members to withdraw from the stagnant industry umbrella organization, said Oscar Garcia, the Institute of Electrical and Electronics Engineers, Inc.'s (IEEE) Computer Society representative to the American Federation of Information Processing Societies (AFIPS).

Following that, the board is expected to approve a special session to decide whether to dissolve the 20-year-old organization.

In a letter to its members, AFIPS President Howard Funk predicted a showdown on the level of either a "Waterloo or a watershed."

According to Bryan Kocher, president of the Association of Computer Manufacturers (ACM), the International Society for Technology in Education is pushing to dissolve the organization.

If AFIPS is shut down, member groups stand to receive a portion of its $1.3 million nest egg, based on a percentage of the accumulated amount of dues paid over the years. Kocher estimated that the ACM and IEEE jointly control a $400,000 share.

A reform-minded group led by the ACM and IEEE has countered with a plan to buy out the disinterested parties and remold AFIPS into a government lobbying force.

"Let them go and give them their bucks," Kocher said.

The AFIPS Executive Committee and officers are backing the ACM's and IEEE's reform proposals, along with the Data Processing Management Association and the American Statistical Association.

Reincarnation?

Should his buyout plan fail and AFIPS be dissolved, Kocher has vowed to get together with IEEE and some of the microcomputing groups and "reinvent" AFIPS. "I hope we can make AFIPS the united voice of the computing profession."

AFIPS was formed to represent all U.S. computer groups, but its membership has not changed in 10 years, according to Kocher. It has mostly been occupied with the guardianship of what was once the biggest computer show in the country — the National Computer Conference (NCC).

For some, the writing has been on the wall since the last NCC in 1987, which was followed by the abortive launch of the World Computing Congress in August 1989. The group has done little, if anything, since then.

Internet's hacker 'Dave' arrested

BY MICHAEL ALEXANDER
CW STAFF

Three Australians were arrested last week following complaints by the FBI that the trio illegally penetrated computers in the U.S. One of the computer outlaws was "Dave," an Australian who is accused of breaking into several computers on Internet in recent months [CW, March 26].

The trio damaged data and accessed restricted files in computers in Australia and the U.S., Australian federal police charged. The three hackers were identified as Nashon Even-Chaim, 18; Richard Jones, 20; and David John Woodcock, 21.

Even-Chaim and Jones are students, and Woodcock is a computer programmer. The hackers, who used the handles of Phoenix, Electron and Nom, were charged in a Melbourne court.

The arrests capped an investigation that began in 1988 when U.S. investigators learned that an Australian computer hacker, code-named Phoenix, had penetrated a computer system owned by Citibank. Woodcock, or "Dave," is Phoenix, Australian federal police alleged.

Australian federal police began their investigation last July after the passage of new legislation designed to combat computer crime in Australia.

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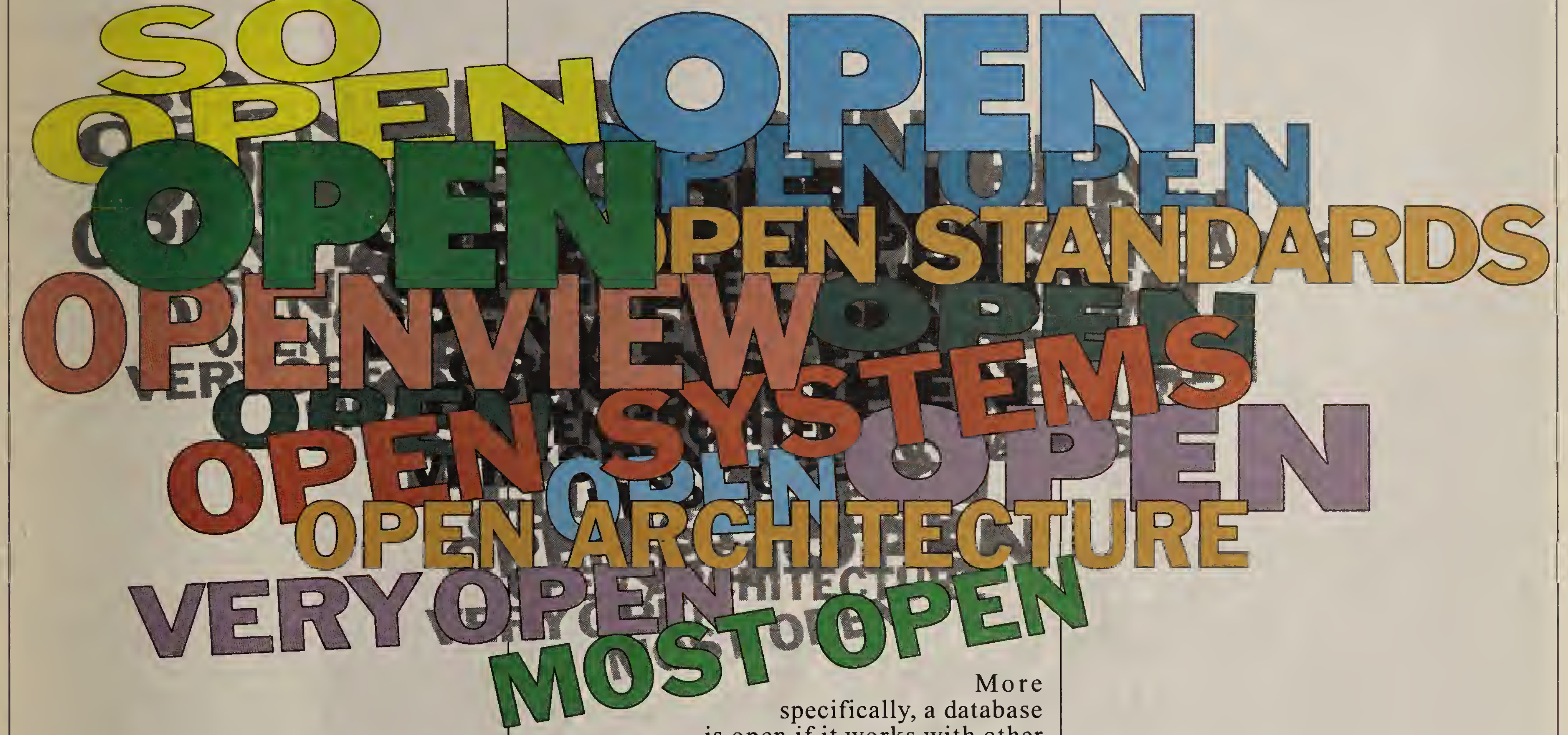

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D&B aims at manufacturing control

BY MAURA J. HARRINGTON
CW STAFF

Seeking to strengthen the tie between the factory floor and business planning systems, Dun & Bradstreet Software last week announced a computer-integrated manufacturing (CIM) system designed to manage and control the manufacturing process and furnish a structure for CIM integration.

With major reorganization going on in factories, the manufacturing resource planning (MRP) market is growing at about 10% per year, and "next-generation" interactive manufacturing systems using CIM technology are in high demand. They rate first on the market growth chart under the $500 million to $600 million MRP business, according to analyst Anthony Friscia, president of Advanced Manufacturing Research in Cambridge, Mass.

The Factory Control Management System (FCMS) was developed by D&B's Advanced Manufacturing International (AMI) division for use on Tandem Computers, Inc.'s proprietary Guardian operating system. It includes development tools and applications, according to Robert Peyton Tabb, director of factory systems for AMI, formerly a division of MSA Software.

While IBM is the MRP market leader — with a solid 50% market share — other leading MRP II companies, such as AMI and Tandem, have plenty of room to grow in the CIM market, Friscia said.

AMI chose to port its new software system to Tandem because of its real-time database capabilities, according to Tabb. FCMS, he added, will be used in conjunction with the Tandem Integrated Management Environment, a real-time SQL-based database.

"What you're seeing is that companies are realizing they have to become more structured, and they must reorganize," Friscia said. Organizations are also realizing their need for a much more interactive manufacturing system that tightly combines both design engineering and factory engineering, he added.

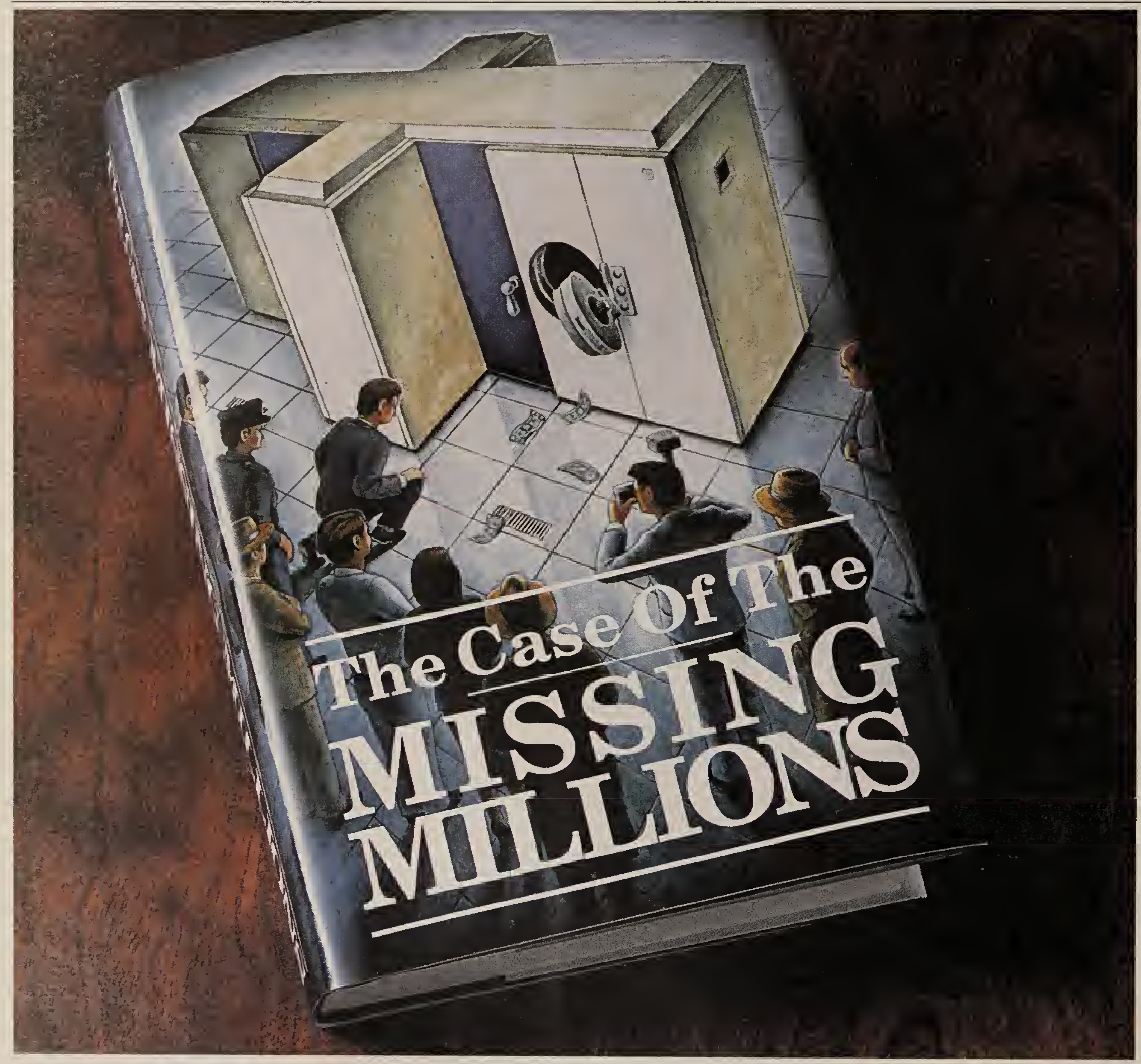
> WITH MAJOR reorganization going on in factories, the manufacturing resource planning market is growing at about 10% per year.

"For a product like this, a cross-disciplined project team would be set up within the company, probably consisting of a factory operator, a manufacturing engineer, an IS manager and a couple of outside consultants in many cases," in order to put the system in place, Tabb said.

While the upcoming FCMS may change the way people manage their CIM system, it does not have to change the structure of operation within the company, Tabb said. It can also sit on top of an existing application such as an automatic storage and retrieval system.

FCMS Release 1.0 includes a manufacturing methods management subsystem; inventory control management; resource tracking and control of schedules, events, conditions and resources; and information exchange management, which integrates FCMS with other automated systems such as a host-based MRP system, data collection or a financial system. Future releases will add statistical quality control and maintenance and will enhance the labor and scheduling subsystems, Tabb said.

Prices for the software, slated for general availability within the next two months, will range from $100,000 to $500,000, depending on configuration, Tabb said, adding that FCMS will be marketed by AMI and Tandem.



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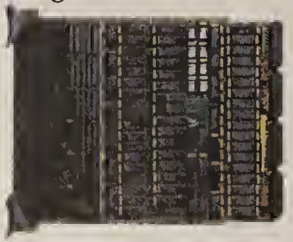
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Maxtor salvages sunken vendor

Disk drive purveyor takes over helm for battered Miniscribe

BY NELL MARGOLIS
CW STAFF

LONGMONT, Colo. — San Jose, Calif.-based Maxtor Corp., a nearly $1 billion purveyor of disk drives, bought low-end disk drive vendor Miniscribe Corp. out of bankruptcy last week for $46 million and announced plans to run the legally and financially battered firm as a subsidiary.

For Miniscribe, which skidded into financial reverses some 14 months ago and spiraled toward disaster when an internal investigation uncovered evidence of massive fraud at the highest corporate levels, the Maxtor offer comes as the end of a nightmare. For Miniscribe customers, analysts said, it is likely to prove a dream of a deal.

"Users should be feeling a lot better — especially considering that many must have been wondering how long they would *be* Miniscribe users," said Steven Ossad, who follows both Miniscribe and Maxtor at Montgomery Securities, Inc. "Now they'll get the same drives, from a quality company that offers other lines as well."

The U.S. Bankruptcy Court in Denver — arbiter of Miniscribe's fate since the company filed for Chapter 11 protection Jan. 1 — accepted Maxtor's bid at an auction of Miniscribe assets held last Wednesday. Maxtor immediately reiterated its earlier-stated intention of maintaining and supporting Miniscribe's 3½-in. disk drive line. "We believe the Miniscribe 3½-in., 1-in.-high product is the leadership product for the next generation of personal computers," said Maxtor Chief Executive Officer George Scalise in a prepared statement. In addition to the encouraging words, Maxtor offered its new subsidiary some much-needed working capital: a credit line of up to $30 million between the acceptance of the offer and its close, not to be credited against the purchase price.

Robert Katzive, vice-president of Disk/Trend, Inc., a market research firm based in Los Altos, Calif., also viewed the deal as good news for Miniscribe users in that it saves its imperiled supplier "from becoming an orphan, or falling prey to a buyer that would view it as a cash cow." The fact that Maxtor is a player in the disk drive market, but not in the low-end niche traditionally plied by Miniscribe, bodes doubly well for the continued vitality of the Miniscribe line, according to Katzive.

Over the past several quarters, Maxtor has emerged as one of a cadre of companies reaping rich rewards from disk drive territory: Quantum Corp. and the currently booming Conner Peripherals, Inc., for example.

On the other hand, Katzive said, "Maxtor doesn't understand the low-end business all that well, and the folks at Maxtor are smart enough to know what they don't know."

Timeplex adds Time/View link

BY ELISABETH HORWITT
CW STAFF

WOODCLIFF LAKE, N.J. — Timeplex, Inc. moved a step closer to its goal of having a windows-based, graphics-driven network management system for each of its network equipment lines by announcing the Time/View 2500 Element Management System for its packet switches last week.

However, the company is still struggling to come up with a coordinated strategy for providing integrated management across its disparate networking equipment families, company spokesman William Madaras said. Late last year, Timeplex finally shipped the long-delayed Time/View 2000 to manage its Link family of T1 switches. A Simple Network Management Protocol-based system manages Timeplex's Timelan 100 routers and Fiber Digital Data Interface concentrators, with a different system managing Timelan 10 bridges.

The latest addition to Timeplex's management family, the Time/View 2500, is a mouse-driven, windows- and graphics-based, multitasking system that is said to provide alarm monitoring, configuration management and accounting across the Timepac line of packet switches and packet assembler/disassemblers.

Timeplex expanded that line last week with the Timepac NP 1000, a high-end packet switch that is said to process 1,000 packet/sec. and support up to 28 ports.

Timeplex has indicated that it will eventually support AT&T's Accumaster Integrator as an overall management platform but has not given a time frame. Also "definitely still in the works" is Timeplex's long-delayed Time/View 4000, an Open Systems Interconnect-based system that will provide integrated management across some, but not necessarily all, of Timeplex's product lines, Madaras said. "We still have to decide what [networking system] feeds into what and what manages what." There is no firm availability date for the Time/View 4000.

Pricing for Time/View 2500 begins at $25,700; NP1000 is priced from $16,600 to $56,000. Both are available now.

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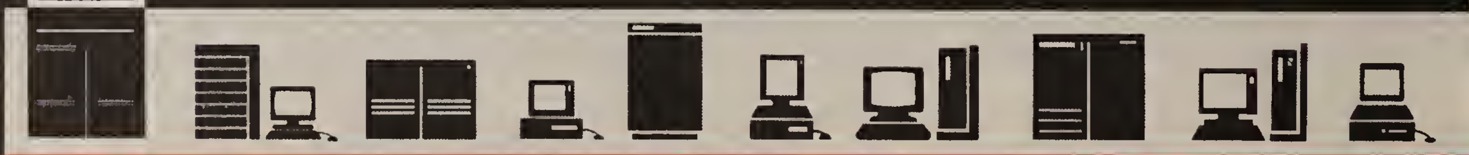

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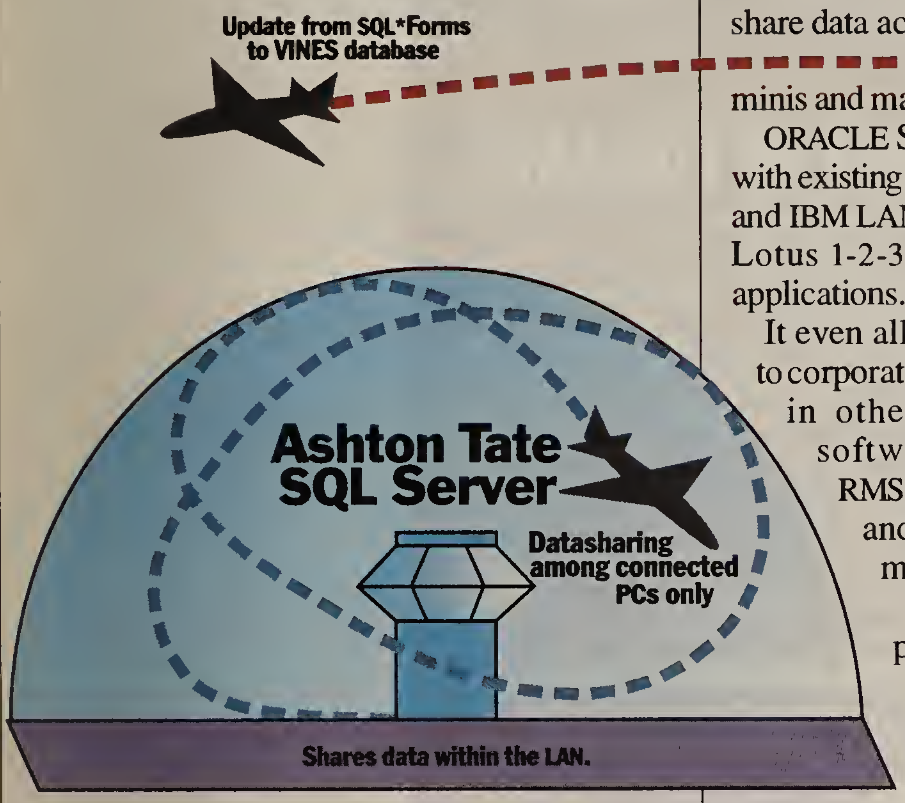
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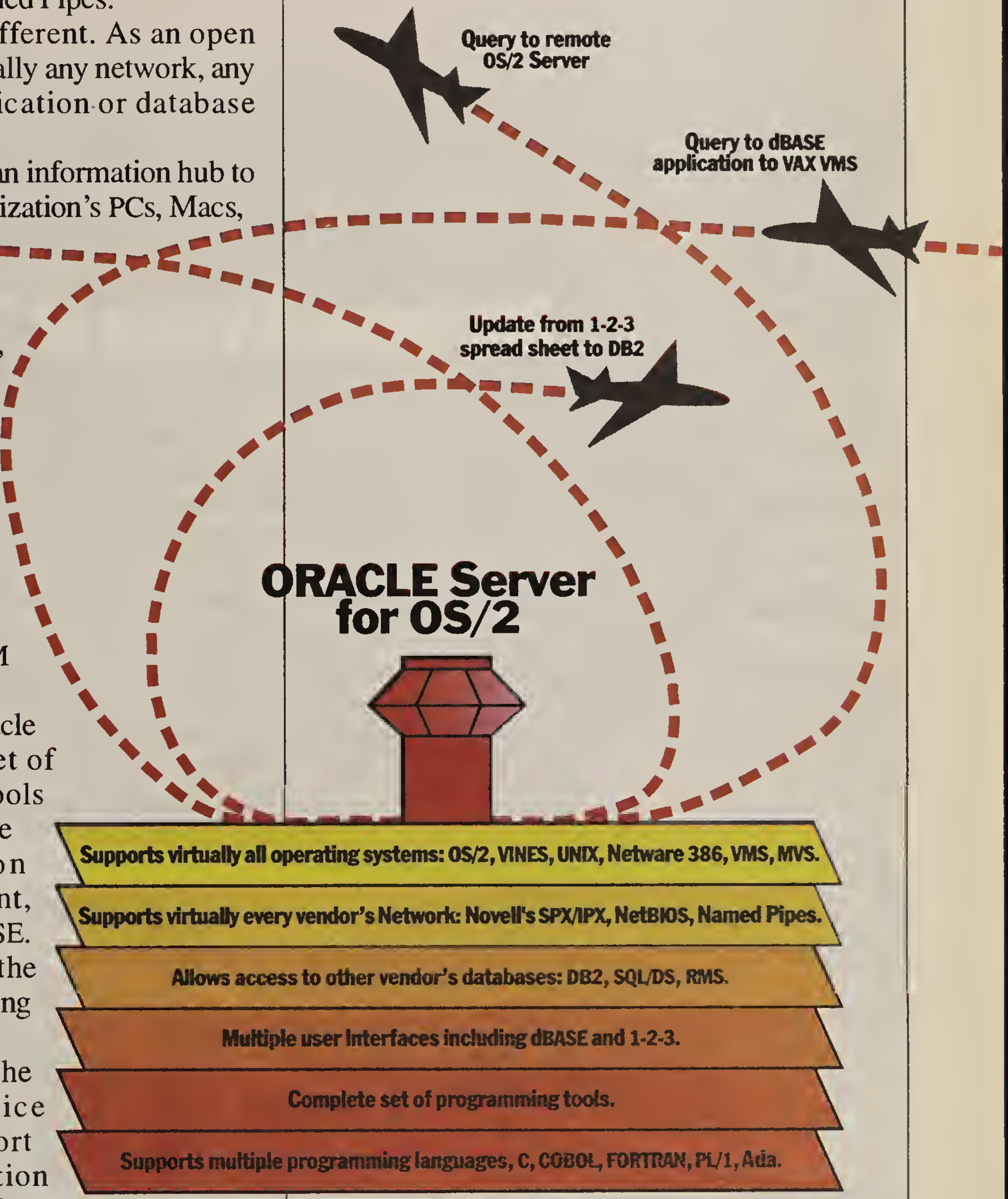
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Altos minicomputer hops on EISA bus

BY RICHARD PASTORE
CW STAFF

It may be a case of "If you can't beat 'em, join 'em." With their market beset by encroaching high-end personal computers, minicomputer makers are either selling their own PCs (a la Digital Equipment Corp.) or adopting PC technology. Last week, Altos Computer Systems did the latter, unveiling what may be the first true minicomputers incorporating the Extended Industry Standard Architecture (EISA).

In addition to the open bus, other standards crammed into the two new Altos boxes include Intel Corp.'s I486 microprocessor, AT&T's Unix System V Release 3.2 and the small computer systems interface (SCSI).

"As the PC market moves toward EISA and IBM's Micro Channel Architecture, you'll see more Micro Channel- and EISA-type minis," predicted David Card, an analyst at International Data Corp.

The payoff for minicomputer users will be cheaper price points for high-volume add-in boards and a broader selection of peripherals conforming to the bus architectures, Card said.

The Altos Multiuser System (AMS) 5000 is configured for up to 200 active users and is targeted at small businesses with a mix of character- and graphics-based applications.

The AMS 5000 uses a 25-MHz 486 chip and comes standard with 8M bytes of main memory (expandable to 64M bytes), 128K bytes of external cache, a 440M-byte hard drive, a 525M-byte tape backup, a 1.4M-byte floppy drive, eight EISA slots and an SCSI card.

The system can be expanded to support 29G bytes of disk storage in 30 disk drives, compared with 5.96G bytes for Compaq Computer Corp.'s Systempro, Altos said. Pricing starts at $25,000.

The Altos Power Server 5000 high-performance file server is aimed at network users in small businesses and departmental computing environments. The $40,000 unit supports most networking software standards and is driven by Altos' high-performance file processor card.

Both systems will ship in volume this month, company President Ronald Conway said.

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Leading Edge booster pact

BY ALAN J. RYAN
CW STAFF

WESTBORO, Mass. — The pendulum is once again the upswing for Leading Edge Products, Inc. The maker of IBM Personal Computer clones, pumped up by a $50 million investment over the past year from its parent, Daewoo Telecom Co., announced a two-year accord with Softsel/Microamerica last week.

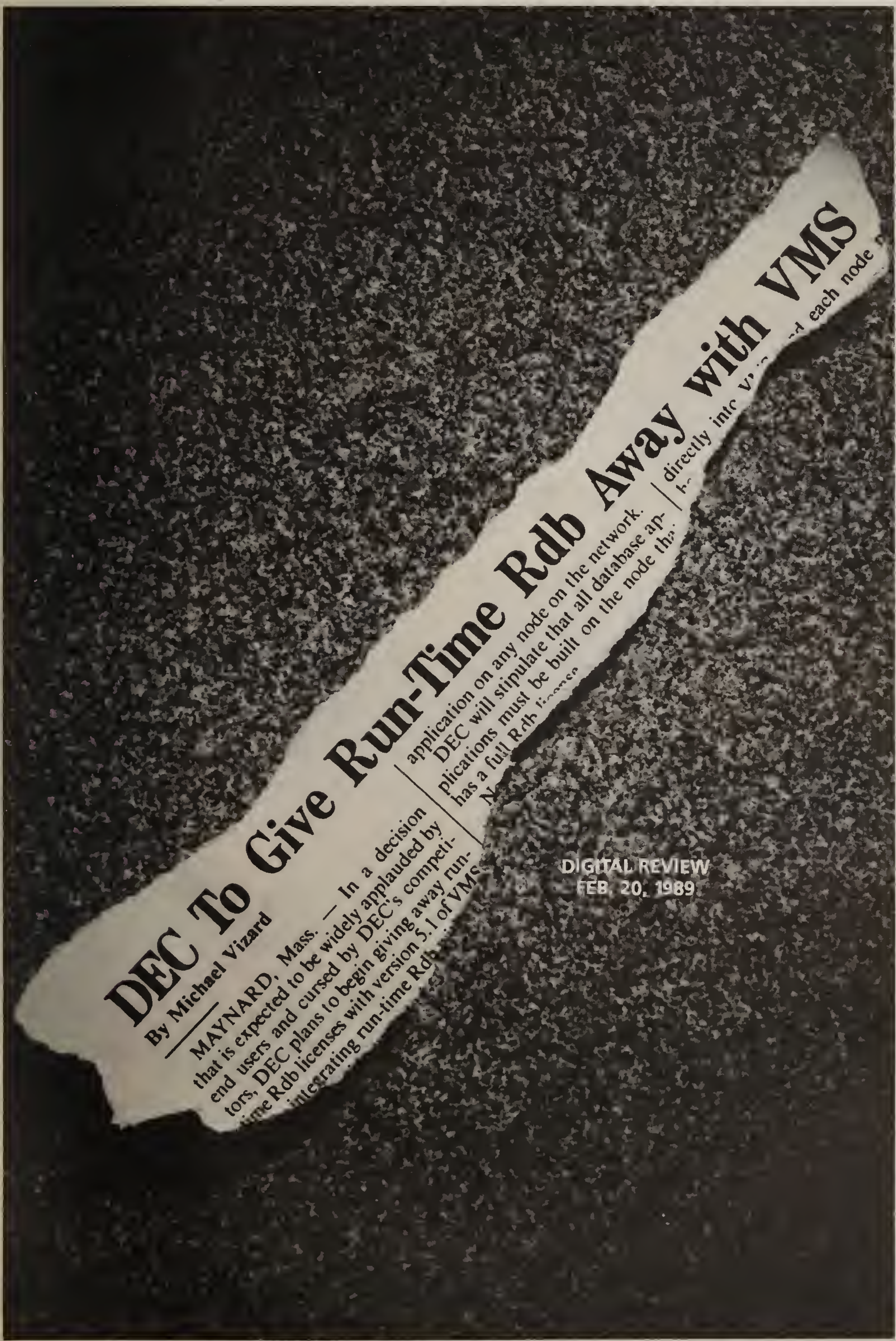
The move signals the first pact with a national distributor in Leading Edge's up-again, down-again history and ends its exclusive commitment to dealer-direct sales. Shipments to the distributor are scheduled to begin immediately. Leading Edge said the deal will be worth $50 million over two years.

The firm also announced that it will sign five regional distributor contracts valued at $38 million by April 25, reportedly giving Leading Edge representation in more than 25 states in addition to the Softsel/Microamerica dealers, systems integrators and value-added resellers.

The company's senior vice-president of marketing, Robert Henderson, said the deal with Softsel/Microamerica will help put Leading Edge products into the international marketplace.

Just a year ago, it was uncertain where, if at all, Leading Edge products would be. In February 1989, Leading Edge had filed for bankruptcy protection. In October, Daewoo Telecom, which makes the Leading Edge personal computers, scooped up what remained of the company.

Rdb and FOCUS 4GL: One is free, the other pays for itself.



DEC To Give Run-Time Rdb Away with VMS

By Michael Vizard

MAYNARD, Mass. — In a decision that is expected to be widely applauded by end users and cursed by DEC's competitors, DEC plans to begin giving away run-time Rdb licenses with version 5.1 of VMS integrating run-time Rd

application on any node on the network. DEC will stipulate that all database applications must be built on the node that has a full Rdb license.

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DIGITAL REVIEW
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ADVANCED TECHNOLOGY

TECH TALK

Look for "smart" houses, built around personal computers, consumer electronics and appliances that communicate with each other, to finally appear on the U.S. landscape during the 1990s, according to a new report from Frost & Sullivan, Inc., a market research firm. The home automation market will be more than $2 billion per year by 2000, assuming that industry groups in electronics, major appliances, utilities and a variety of other areas can cooperate on smart-house standards. Driving the home automation market will be an aging population, an increase in dual-income and single households and a greater appreciation of the home as an investment, Frost & Sullivan reported.

……

A digital panoramic X-ray system developed by researchers at The University of Texas Health Science Center at San Antonio exposes dental patients to less radiation, does not require film processing and is cheaper to use than ordinary machines, the researchers said. The new machine, dubbed the DPX 1000, uses electronic detectors instead of film to digitally record images of a patient's facial structure and store them on computer disks. The images are viewed on a monitor and can be enlarged or enhanced for diagnosing disease.

……

Zipping along at 1.5 billion floating-point operations per second? If so, Cray Research, Inc. wants to hear about it. The company is currently accepting entries for its 1990 Gigaflop Performance Awards, which will recognize computational researchers who are doing significant work on Cray supercomputers at speeds at or above 1.5 GFLOPS. Entries for the program are being accepted through Sept. 1. A panel of Cray Research scientists and engineers will review each entry, and awards will be presented during the Supercomputing '90 conference in New York on Nov. 12-16. Contact any Cray sales office for entry forms.

Finally, a dream come true: The erasable optical disc

Firms bringing the technology to market

Tom Monahan

BY MICHAEL ALEXANDER
CW STAFF

The optical disc has a shimmering appeal that may be unmatched by virtually any other storage medium. A single disc, even one only 5¼ in. across, is capable of warehousing vast amounts of data and is practically impervious to damage in normal use.

However, one of the optical format's shortcomings has been that once data has been recorded on it, the disc cannot be repeatedly erased and recorded.

Until recently, a rewritable, erasable optical disc was little more than pie in the sky, but it looks as though the medium is finally about to alight in the marketplace. Several firms are planning to introduce rewritable optical disc systems this year.

They want it now

Analysts said that there is considerable pent-up demand for rewritable, erasable optical recorders. According to market research firm Freeman Associates, Inc. in Santa Barbara, Calif., more than 364,000 erasable optical drives will ship in 1992, up from 5,300 in 1988.

There are three competing technologies for erasable discs: magneto-optic, phase-change and dye-polymer (see sidebar).

Several companies have shown off prototype compact disc systems, capable of recording and erasing CDs, that are geared toward allowing computer users to create CDs and compact-disc/read-only memory (CD-ROM) discs.

Like conventional CDs used by home audio enthusiasts, recordable CDs have a 5¼-in. diameter and store data on a single side. The disc's storage capacity is also the same as a CD's or CD-ROM's — about 75 minutes of music or about 550G bytes of data.

Japan's Sony Corp. and Taiyo Yuden Co. have been touting a system capable of eking 74 minutes of audio out of a CD. Sony's disc, which can also be used to store computer data, can be reused one million times, Sony said.

Sony has put a model number on its unit, CDR-1978 CD-MO (for magnetic optical), but not a price tag. Taiyo's disc has been dubbed a CD-R because it can be recorded once but not erased.

Other firms have shown CD-R systems using a recorder developed by Yamaha Electronics Corp. and Philips Telecommunications N.V. Photo Film Co. has demonstrated a recordable CD aimed at the computer market, and Meridian has shown its CD Professional system for the CD-ROM market.

Tandy Corp. made a large splash two years ago when it announced that it would have an erasable digital compact disc system on the market in 1990 for an inexpensive $500. But the Tandy High-Intensity Optical Recording (Thor) CD system "is not going to happen this year," said Ed Juge, director of marketing at Tandy Corp. "We're still going forward with it full steam, but there are a lot of issues related to getting broad industry support, so that it doesn't make sense to go forward with it right now."

Although analysts greeted Tandy's initial announcement of a low-cost CD recorder with considerable enthusiasm, the company has had difficulty getting its rivals to support the format. The analysts said that if Tandy was successful in getting backers for its technology, it would be able to make a significant leap ahead of the Japanese and European firms that pioneered CD technology. So far, that has not happened, creating the delay, Juge said. "We don't want it to be another Betamax — technically superior, but dead because it did not have broad industry support," he said.

Some of Tandy's rivals were also skeptical that the firm could actually push the product off the drawing board and onto retail shelves. There are significant technical hurdles that must be cleared first, they said. The technical bugs are close to resolution, Juge said, adding that "we're dragging our feet on the technical issues until we can see industry support coming."

Tandy has not revealed much about its system other than to say it is based on dye-polymer technology and that the disc can be recorded and erased at least 40 times.

Optical discs are not without faults, even ones that record. The transfer rate for optical disc drives is about 1M byte/sec., far slower than that of a Winchester hard disk drive. The access time of optical disc drives is also slow. Steve Jobs' Next, Inc. computer was introduced with a magneto-optic disc drive, but the access time was so slow that the company installed conventional hard disk drives in later models in addition to the optical drive.

Rubbing it out

There are three competing technologies for erasable optical discs: magneto-optic, dye-polymer and phase-change.

- **Magneto-optic.** A magneto-optic disc stores data as a magnetic pattern in a substrate — a layer of magnetic media — sandwiched between two layers of clear, polycarbonate plastic. Data is recorded and erased on the substrate by triggering a relatively high-powered recording laser beam that heats tiny spots in the magnetic media to a temperature that allows it to accept magnetic patterns. Data is retrieved by shining a lower-powered laser at the magnetic layer and reading the reflected light. The reflected beam's polarization is rotated in one direction or the other depending on the polarization of the magnetic field. The laser senses the direction of rotation and thus the magnetic pattern.
- **Dye-polymer.** Data is stored in the form of microscopic pits in a dye-polymer substrate that is sandwiched between two layers of clear polycarbonate, similar to other CDs. To record information, a laser burns a tiny pit or dimple representing a bit of data in the dye-polymer media. To erase information, a second laser smooths out the dimple.
- **Phase-change.** Data on a disc using phase-change technology is stored in a thin film coating on the disc that serves as a recording medium. The film is heated to alter its structure between a highly reflective, crystalline state and a less reflective, amorphous state.

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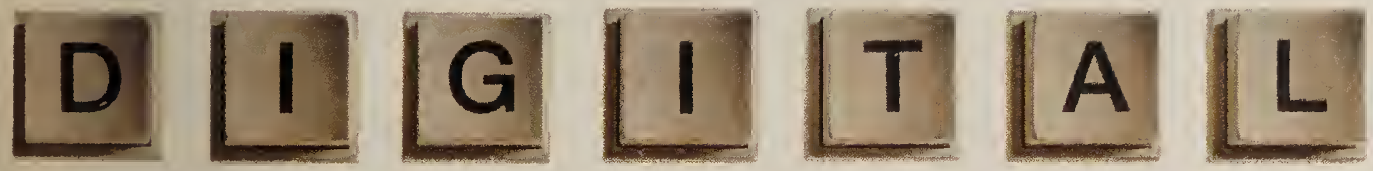

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EDITORIAL

CASE concerns

THERE'S AN OFT-TOLD story about a U.S. firm's attempt to boost productivity from workers at its Tokyo subsidiary.

The firm hired an office consultant to study the situation in Japan, and the consultant returned with a list of recommendations. Included was the purchase of some new office automation equipment and expanded office space to alleviate the terribly crowded conditions that prevailed.

But in a surprise visit to the office a few months after the changes were implemented, the company president found that the workers had vacated much of the expanded office space and voluntarily mashed their desks next to one another again. They were also back to sliding abacus beads for routine calculations.

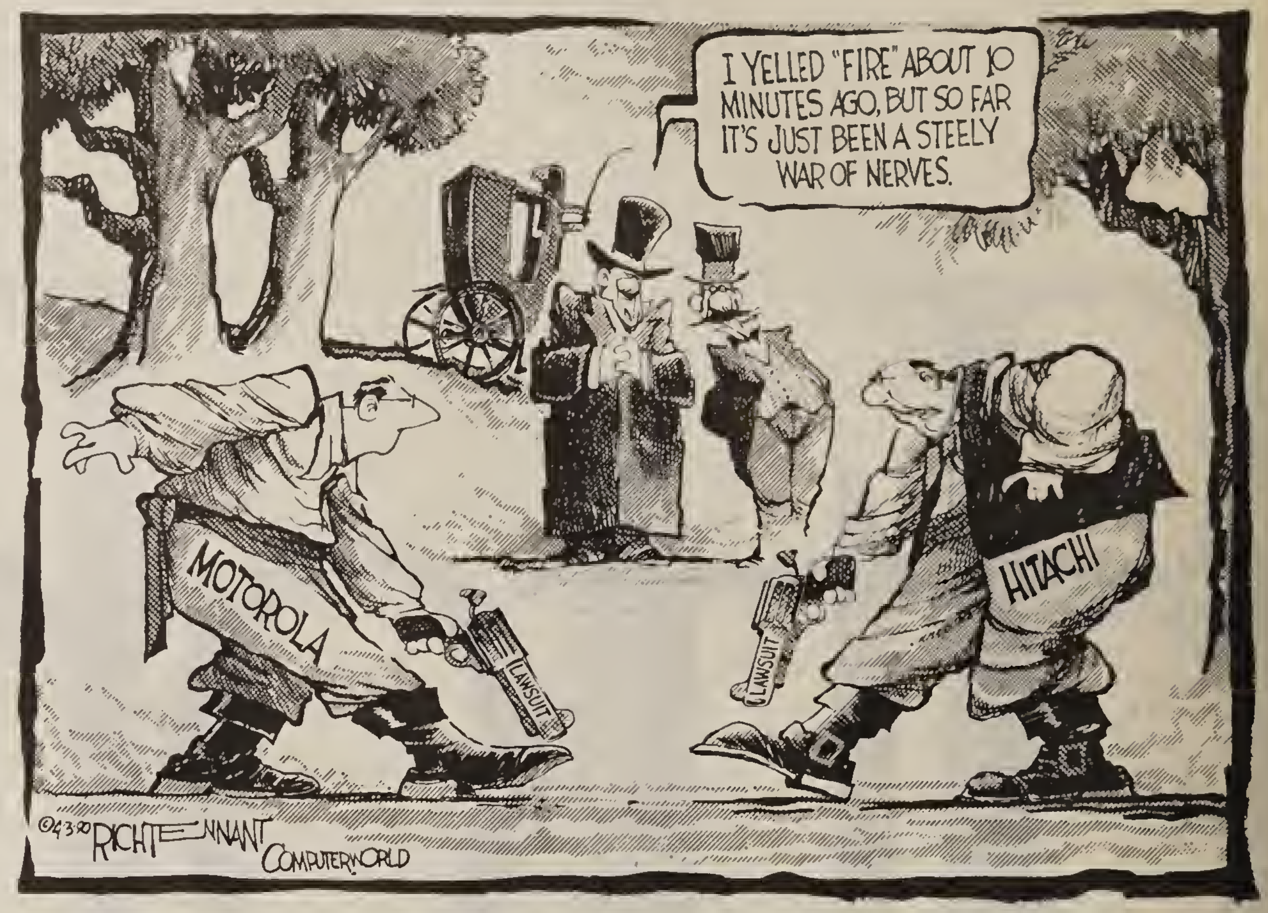
Truth or parable, the point here is well worth taking. When it comes to wringing the full benefit from the ocean of productivity tools, you often have to look first at preparing the workers to use the tools. Both Ford and General Motors undertook multibillion-dollar automation drives in the early 1980s, with Ford getting far superior results — arguably because Ford dealt much more effectively with acclimating workers to the new techniques imposed by new technology.

This point should not be lost within IS sites undertaking computer-aided software engineering endeavors, which perhaps a majority of large sites and a growing number of midsize sites have done already. It's so easy to be swept up in the promise of CASE when you are awash in spaghetti code, multiple development methodologies and all the other trappings of software development inefficiency that have evolved.

Then along comes this phenomenon that — some would tell you — will automate your development problems away in five easy steps. The problem is, the hype and rhetoric seldom talk about the human side of the equation — the fact that CASE methodologies are fundamentally different from most in use today.

So before embarking on a CASE cruise or adding more CASE tools to your development fleet, consider these simple steps (extracted from this week's Product Spotlight on page 61).

- Start by educating software engineers in the structured techniques so vital in using CASE.
- Set reasonable and well-defined goals before considering the range of CASE tools available. Don't expect miracles.
- Go to great lengths to ensure that the tools you select match the environment they'll be brought into. Today, and for the foreseeable future, there is no one-size-fits-all in CASE.
- Don't assume that a single structured technique will fit all your development needs.
- For your sake, do a complete and honest cost analysis, assuming that the annual maintenance costs of CASE development can easily equal initial costs for hardware and software purchases.


I YELLED "FIRE" ABOUT 10 MINUTES AGO, BUT SO FAR IT'S JUST BEEN A STEELY WAR OF NERVES.
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COMPUTERWORLD

LETTERS TO THE EDITOR

OS/2 fairness

I was pleased to see Bill Gates finally defend OS/2 in the press [CW, Feb. 26]. Although he touched on several valid points, there were other points either missed or shortchanged.

Of note is enterprise computing. In the corporate world, there are far more IBM 4300s and 3000's running VSE or MVS as the hub of information systems than there are Sun, DG or other Unix machines. In the current climate of decentralizing IS, it makes more sense to have connectivity between the desktop and mainframe than to support mutually exclusive systems.

Unix, as a multiuser operating system, was designed for the technology of the time, TTY; Glas TTY's are not exactly abundant on the corporate desktop. OS/2 provides Systems Network Architecture support at the desktop or through a gateway on the network. SQL Server will soon provide DB2 access. The server component of LAN Manager will reside under MVS. LU6.2 sessions to the desktop are a reality under OS/2 today.

From an engineering point, I view writing code for OS/2 as far more consistent and intuitive than Unix. Further, excluding Presentation Manager, the coding far more resembles MVS, VSE and VMS with regard to interfacing to the underlying operating system. This has important financial implications when considering retraining of existing IS professionals. When viewed with the many potential Unix graphical interfaces, Presentation Manager should not be seen as a restrictive element of OS/2.

Security is another area that does not get much press space by the Unix proponents. Unix was designed to allow dial-in capability to the operating system. Once connected, a savvy user could make himself appear as the master operator, leaving system integrity to the good nature of the dialed-in user. OS/2, with server software, is more restrictive in what a user can access.

The thrust of this letter is not to slam Unix but to provide a fairer view of OS/2. Doug Barney hinted at what really is the pivotal point in this great Unix-OS/2 debate: Perception is everything. Although IBM or Microsoft could kill OS/2, neither can make it a success. The user, corporate or personal, will.

Walt Corey
Senior Systems Engineer
North Scituate, R.I.

No damage done

As an information systems professional with 19 years of experience, I have to take issue with an example cited in the article "Facing up to career busters" [CW, Feb. 26]. Janet Ruhl maintains that the alleged failure of the IBM 9370 has somehow permanently injured the careers of those who have worked on it. I submit that this is nonsense.

The first 9370 that I worked on came equipped with VM and SQL/DS. Once we plugged it in, our attention was directed at designing a relational database and not what was at the other end of the cable. With the popularity and growth of VM, SQL/DS and other 9370 products, I suspect that those working on this platform will have a bright future.

Bruce W. Barnes
Information Technology Manager
Eastern American Energy Corp.
Charleston, W. Va.

Disklaimer

In your article on disk arrays, "Pulling more memory out of a disk" [CW, Feb. 12], the author mistakenly defines a disk array as "a stack of several inexpensive hard disks on a single spindle." The term "disk array" is actually used to describe an arrangement of several small-format disk devices configured to radically increase I/O bandwidth.

Although spindle rotation is often synchronized in disk array implementations, there is no requirement that the disks have to be mounted on a single spindle. Furthermore, disk array configurations are mostly made up of several multiplatter disk devices.

The author also mentions that one of the drawbacks of disk arrays is the requirement for built-in data redundancy (to guard against the loss of one or more disk devices). With single disk devices, data redundancy is achieved by employing a fallback or shadow drive at a cost of two disk drives per data disk. Disk arrays, however, are much more cost-effective because data redundancy can be maintained by a single parity disk for each "string" of three to four data disks.

Eric Potter
Teradata Corp.
Los Angeles, Calif.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931; MCI Mail: COMPUTERWORLD.*

Responsible recommendations

LEE GRUENFELD

One of the more common transactions in computer systems procurement occurs when a hardware vendor recommends a software company to an end user. All hardware vendors maintain a great number of relationships with software vendors to ensure that they have a way to satisfy customer demands for application software.

However, what is the hardware vendor's responsibility when it recommends another company to you? Do you have any legal right to expect a certain level of diligence and thoroughness, or even recourse against the hardware vendor in the event of a problem?

The recent case of *Electro-Matic* v. *Prime* sheds some light on this situation and contains a warning for the unwary customer.

Several years ago, Electro-Matic Products, Inc. contacted Prime Computer, Inc. to see about procuring some new systems. Prime recommended that Electro-Matic get in touch with Create Data, an independent software house that develops applications to run on Prime equipment.

Electro-Matic did its own investigation of Create Data. In turn, it agreed to license Create Data's software as well as buy Prime gear through it and get conversion and installation assistance.

About a year and a half later, it became evident to Electro-Matic that the implementation was deeply troubled, and it felt that Create Data could not finish the job. It found another vendor to complete the work and filed suit, not only against Create Data but against Prime as well.

Prime responsibility

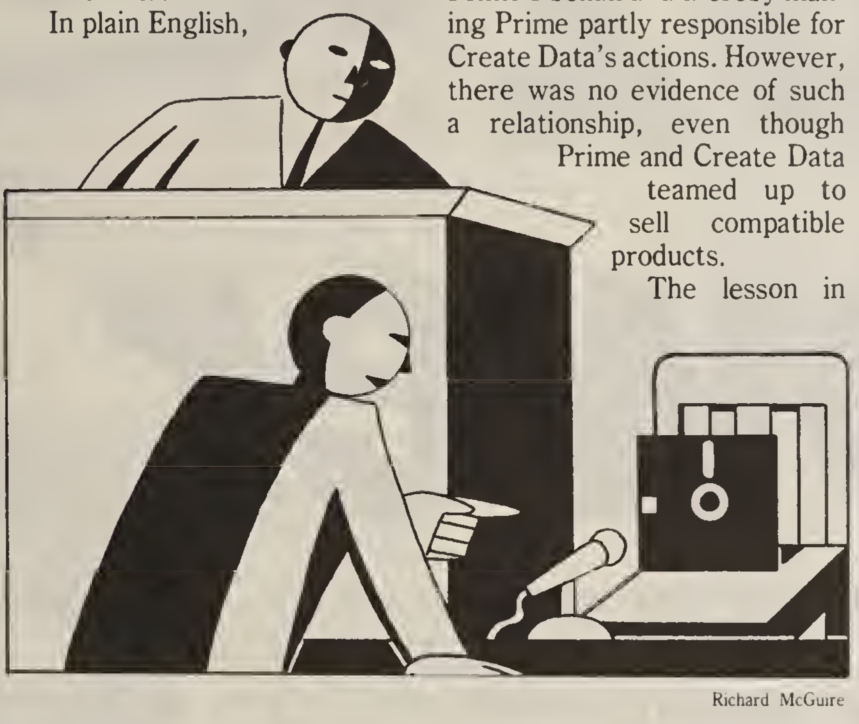
The case against Create Data was fairly standard and is not our concern here. What is more interesting is Electro-Matic's contention that Prime was responsible for the failings of Create Data, because Prime recommended it and it was presumably acting as Prime's agent in the deal. Among other things, Electro-Matic claimed that Prime was guilty of fraud in representing that Create Data could handle the job.

After the trial, the judge felt strongly enough about the case to decide it without even giving it to the jury.

Much to the surprise of Electro-Matic, the judge found in favor of Prime. His reasoning carries some important lessons.

First, there was no legal obligation on the part of Prime to investigate the competence of Create Data.

In plain English, a hardware manufacturer's recommendation of a software vendor carries no implication that the hardware vendor did anything at all to check out the software vendor prior to the recommendation. It simply has no obligations in this regard.



Richard McGuire

Second, Electro-Matic carried out its own independent investigation of Create Data and reached its own conclusions about Create Data's ability to do the work. Thus, Electro-Matic did not really rely on Prime but just used Prime's recommendation as a starting point for its own research.

Finally, Electro-Matic tried to demonstrate that Create Data was an agent of Prime, acting on Prime's behalf and thereby making Prime partly responsible for Create Data's actions. However, there was no evidence of such a relationship, even though Prime and Create Data teamed up to sell compatible products.

The lesson in this and other closely related cases is clear: When one vendor recommends another, it doesn't necessarily mean a thing in terms of the recommender standing behind the work of those it recommends. All you may be hearing is a simple opinion or suggestion with no legal obligation behind it.

The whole gamut

What if two vendors have a formal alliance or other joint marketing arrangement? According to computer lawyer and lecturer Steve Shaiman at Shaiman & Bosch in Philadelphia, the best approach is to visualize a spectrum of possibilities, ranging from no formal relationship other than "passing familiarity" all the way to a signed agreement for a formal agent-principal arrangement.

Clearly, the former provides the customer with little recourse, as in the Electro-Matic case, and the latter would be a much stronger case for reliance on a recommendation. As always, however, the facts are unique to each situation, and it is impossible to accurately predict outcomes in a courtroom.

The best course of action for the savvy customer is to request full disclosure of the nature of the relationship, as well as a statement regarding the degree of joint or individual responsibility.

If you are doubtful, request that the hardware vendor become a party to your contract with the software vendor. You will then quickly discover the degree to which the hardware vendor is really willing to take responsibility for the software vendor's performance.

Gruenfeld, a management consulting partner in the Los Angeles office of Deloitte & Touche, specializes in computer-related legal matters, including contracting and litigation.

Users, IS perpetuate conflict of interest

JOHN BARNES

I have always been fond of the definition I learned a few years ago for user-friendly software: "Programs and utilities developed to make it easy for everybody, not just professionals, to degrade data integrity."

There's a lot of truth in that definition — widening the access to anything automatically makes its quality problematic. In information systems, we're painfully acquainted with the fact that users want two things: quick, easy updates and immediate access to accurate data. Because the two responsibilities are eternally in conflict, we can confidently depend on the fact that someone is angry with us most of the time.

Furthermore, the interests of your own staff and of other departments will always conflict to some extent. After all, in a perfect world for the IS staff, there would always be plenty of time for everything to get done, everything would work perfectly the first time, users would always know exactly what they wanted and describe it accurately, and if by chance anything ran a bit late, users would never, ever, even think of complaining.

On the other hand, in the user's perfect world, at the first vague feeling that something else was needed, you could call IS and just say, "I'm a bit worried about computers and stuff in my department." Thirty minutes later IS would call back and announce that exactly what was needed had just been installed.

Living with imperfection

Neither perfect world is going to happen — and the reason for that, in part, *is* the other group. There are built-in conflicts both between user and IS and between the different needs of the user. This is what makes temptation start to whisper to the IS manager.

The demands that come in are so often foolish and people so often find ways to ask for things that would be disasters if they got them, that somebody needs to take charge here. It *looks* like the first thing to do is to get the users straightened out on what they need and what is possible. However, no matter how much it looks that way, don't do it.

The most depressing thing about most consulting jobs is that you end up with such a low opinion of business in general — because virtually every company you see up close is in trouble, or it would not have called you.

FROM WHAT I have seen, there is almost no surer way to create completely unnecessary crisis and conflict than for IS to try to dictate procedure in other departments.

From what I have seen, there is almost no surer way to create completely unnecessary crisis and conflict than for IS to try to dictate procedure in other departments. It is a safe bet that if you reach to take control of the input from users, you will be in deep trouble for the following reasons:

- First and foremost, just as they don't understand your job, chances are excellent that you don't understand theirs. So if you're deciding that some report they apparently never read should not be printed daily, you may be right — or you may be eliminating the one thing they must have in the event of an emergency.
- Most people really don't like responsibility. Why should they? As we all know, having responsibility means trouble lands in your lap. So if some nice, apparently smart people who use personal computers should come into the office and tell you they will be responsible for things that hitherto have been your job (with the implication from them that you don't know how to do it and they do), you may be very tempted to let them have it. It's work off your desk, and it serves them right. Of course, once they've taken responsibility, they may just have a hard time trying to give it back.
- Controlling the input is a classic way in which any system can be driven crazy. Think about the sorry record of generals and politicians who have had intelligence reports rewritten to tell them what they wanted to hear. Often, seizing control of the input simply trades day-to-day friction for every-three-month catastrophes (which you no longer see coming). Another consultant explains it this way: In the same way that we have the electric company or the water company, IS is the "data company." The electric company sees that power gets to your house, but it doesn't tell you what household appliances to buy, even though your choices may sometimes cause trouble that they would rather have avoided.

Furthermore, the water company sells you water — it doesn't standardize the soap you wash with or the recipes you cook. Those are not its concerns; it worries only that you get water as good as it has promised and available in the quantities it has promised.

That's not an easy attitude to take, especially when you do have good people and they know what they're doing. It's painful to see things done in substandard ways or to receive obviously silly requests. However, that pain is a basic part of the job, and that attitude is the professional one.

Barnes is Northwest-area manager of ADG, a high-tech marketing company based in San Pedro, Calif.

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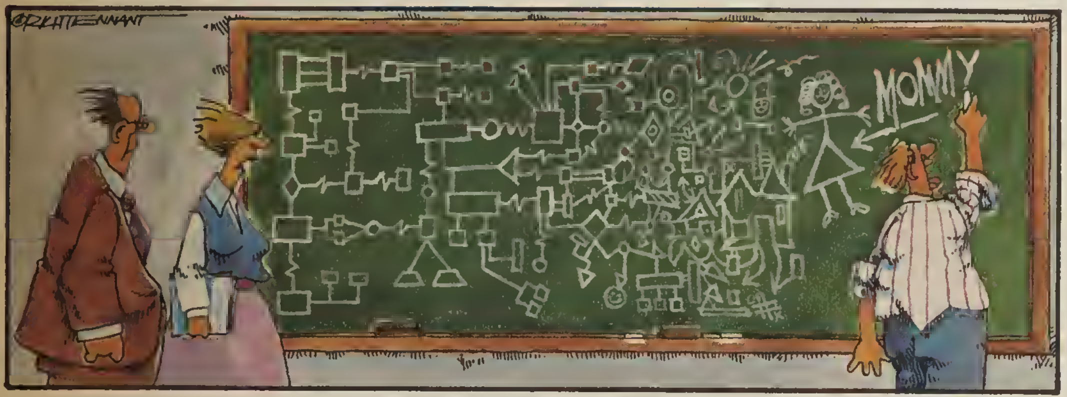

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HARD TALK

J. A. Savage

HP 1000's second wind

In the normal scheme of computer business, a vendor calls the shots.

You don't want to rewrite your applications? Well, too bad, we just introduced a new architecture.

Everything running smoothly? Forget it, we have something better.

In a rare case, users of Hewlett-Packard's 21-year-old real-time computer, the HP 1000, are extending its life into the next century.

Through Interex, an independent user group, the computer's devotees decided to gang up on management. Management responded by doubling the computer's marketing and research and development staff in the last 18 months and promising users a faster model with no accompanying changes needed to run current applications.

The 1000, after all these years, remains the only one of its kind, according to users. Its proprietary real-time operating system delivers fast response and is used for such disparate applications as controlling spacecraft and monitoring drug testing at the Olympics.

Continued on page 30

Users strive to manage multiple databases

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

Managing multiple databases has become the rule in U.S. corporations, as years of developing database management system-specific applications complicate the dawning age of unified information architectures.

"I don't know of one Fortune 1,000 company that has just one relational database," said Bob Davoli, president of SQL Solutions, a consulting company that was recently acquired by Sybase, Inc.

However, frustration is inherent in managing multiple databases because of the technical barriers preventing truly distributed DBMS connectivity.

"I think the main problem is a data administration problem, because you have many different departments that share similar data," Davoli said. "But because they developed their applications separately, the DBMSs were not designed to communicate with each other, and the result is that these departments have redundant data."

Having the right data at the right time helps executives make timely decisions, but the technical barriers to such DBMS-to-DBMS connectivity are significant.

"Our decision-support system is not geared toward the top 20 people in the company," said Charles Feld, vice-president of MIS at Frito-Lay, Inc., at a recent Arthur D. Little, Inc. management conference. "It's directed at everyone in the company." Frito-Lay bases its DBMS architecture on IBM's DB2.

The primary obstacle for most multi-DBMS user companies is that there is not one "vanilla" flavor of the SQL query language. Invented by IBM in the late 1970s, SQL has developed many different dialects, and that alone prevents easy connectivity.

"These SQL dialects differ to the point where your connectivity is a state of mind, rather than a network of DBMSs," said one West Coast DBMS manager.

"We're looking at keeping data acquisition on one side of the house and on providing different forms of data representation on the other," said the manager, who asked not to be identified. "That way, we're us-

Continued on page 30

Imaging market still unfocused

BY ROSEMARY HAMILTON
CW STAFF

Imaging could soon mean big headaches for information systems managers if they do not get a corporate plan under way, warned Roger Sullivan, vice-president of image management systems at BIS CAP International, Inc., a consulting firm based in Norwell, Mass.

Sullivan, who will assume the presidency of the Association for Information and Image Management this week, said the top priority of the trade association — which has a conference and trade show this week in Chicago — will be education. The IS world is still unclear about what it wants to do with imaging, and vendors have provided little help in clarifying the issues, Sullivan said.

"Imaging is still not part of the mainstream," he said. "It's still an exception process, so people don't understand what they are taking exception to."

BIS CAP's Sullivan *sees murky future in imaging*

The problem, Sullivan claimed, is that many department managers are struggling with productivity problems. In some cases, it is reaching a crisis level, and managers may resort to grabbing a quick fix. However, the fix may be applied on a per-problem basis in the absence of an imaging strategy from the top. The immediate results will be relief, but in the long run, they will be faced with the overwhelming task of bringing together all the imaging pieces. "We're still reeling from personal computers and integrating them," Sullivan said. "Just wait until there are 88 different kinds of images out there."

While the burden is on IS managers to develop a strategy, Sullivan in part blamed imaging system vendors for not providing enough long-term information to users. "Some firms will come up with an imaging strategy, but the majority could be average and just let it happen. That's the potential unless vendors get their migration stories straight and help customers," he said.

Sullivan said the two murkiest areas are imaging standards and imaging systems integration with existing applications.

On the topic of standards, Sullivan said, "The definition of openness depends on whom you're speaking to."

There are several efforts under way by such standards bodies as the Consultative Committee for International Telephony and Telegraphy that would govern many imaging systems functions. These range from image transmission and compression to facsimile output.

Sullivan said imaging vendors are giving a thumbs-up to these developing standards and at the same time are pushing their so-called value-added. That is where the confusion comes in. At times, it is difficult to determine where the value-added leaves off and the proprietary system begins, he said.

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Hospital discovers cure for paper clot

Patient information flows freely under St. Raphael's automated system

ON SITE

BY RICHARD PASTORE
CW STAFF

NEW HAVEN, Conn. — At the Hospital of St. Raphael, physicians, nurses, laboratory technicians and information systems staff have scrubbed up and are ready to operate. The patient: the patient care information system. The disease: paper clot.

Culminating five years of study and evaluation, the New Haven hospital began implementing its automated patient care information system this month. The hospitalwide on-line system will automate every patient record and eliminate the confusion of multiple paper copies of everything from admission records to drug prescriptions. Only 10% to 15% of U.S. hospitals have adopted such a system thus far, according to the American Hospital Association (AHA).

The software, Health Data Sciences, Inc.'s Ulticare, will run on five Data General Corp. hosts and will be accessed from 650 dumb terminals and 50 personal computers located in offices, nursing stations and all 491 patient rooms.

The IS department is recruiting 23 people to administer the system, separate from the staff of 30 that handles billing and financial applications on the hospital's IBM 4381.

The paper chase is a common business ailment, but in a hospital, it can affect patient care. "There's so many pieces of paper floating around, I sometimes question whether all of it is really assimilated by the health care provider and used in the care of the patient," said Dr. Romeo Vidone, president of the medical staff and chairman of the pathology department.

Indeed, nurses typically spend 25% of their day doing paperwork, according to Debbie Salerni, director of surgical critical-care nursing. "A nurse will write down little bits of information on any scrap of paper he or she can find," she said. At the end of of the day, the nurse must take time to sort all this data and rewrite it into patient logs.

With the new system, the physicians and nurses can log on at the terminal near the patient's bedside, entering such things as patient condition reports and prescription orders. The data is then accessible on-line and remains part of the patient's permanent electronic record.

St. Raphael, *in New Haven, Conn., hopes to improve care by cutting time spent on paperwork*

Donald Myers, vice-president of the hospital's medical support and information group, said that once the system is fully installed 3½ years from now, he expects it to eliminate 64 man-years of clerical and information processing labor costs annually.

St. Raphael will realize these benefits only "if they don't screw up and alienate nurses in the way the system is installed," warned Richard Covert, associate director of health care information and management systems for AHA.

"You have to involve them in the selection process and the implementation process," Covert advised.

At St. Raphael, medical professionals have been involved with the automation effort from the beginning. The principal evaluation team consisted of Myers, a pharmacist, a radiologist, a lab technician, a business office staffer and two nurses — including Salerni.

"What I liked best about Ulticare was that it's at the bedside," Salerni said. "That way, you have immediate access to what's happening to the patient."

However, hospital staff expressed several concerns — principally system reliability, security and user reluctance.

Myers chose to address the reliability issue with redundant power supplies and CPUs. Two DG MV15000 Model 20s will function as mirrored archivers, and three Model 10s will handle the applications processing.

"If one application's CPU fails, the others will take over its duties," Myers said. "I think we have reliability well covered."

Security measures include electronically coded terminal "keys" and passwords. Users' access profiles will be built according to their need to know.

Staff reluctance to embrace the system will no doubt be an initial problem, especially among the doctors. "Change will always be looked upon with some trepidation, especially by someone who's used to making decisions and doing things exactly the way they feel they should be done," Vidone said.

However, Vidone is convinced that once a doctor is introduced to the system, he will "see that it makes him much more efficient in seeing his patients."

Myers plans 30 hours of instruction for two-thirds of the hospital's 2,300 employees. Indeed, automation represents a lot of work, Myers acknowledged. But his prognosis is that it will bring "an astounding change for the hospital and be good for the quality of health care."

Cray, Stardent supers win performance award

BY ELLIS BOOKER
CW STAFF

URBANA-CHAMPAIGN, Ill. — Supercomputers, the hot rods of computing, were put through their paces recently, and when the checkered flag fell, a Cray Research, Inc. Y-MP8/832 and Stardent Computers, Inc. Model 3010 had crossed the finish line ahead of a pack of 30 competitors.

While performance benchmarks are nothing new to computer comparisons, this test was the first "objective evaluation and comparison of supercomputer performance," according to officials at the University of Illinois' Center for Supercomputing Research, which developed the test and coordinated the contest.

According to the Center's associate director, George Cybenko, winners of the center's first Bell-Perfect Award outperformed a range of machines, from conventional super- and minisupercomputers to high-performance workstations and systems using reduced instruction set computing technology.

The Perfect Benchmark includes 13 real scientific and engineering applications programs, consisting of more than 60,000 lines of Fortran code. The programs cover a range of typical processing-intensive applications such as circuit simulation, structural analysis, fluid mechanics and computational physics.

The test is further divided into a "baseline," in which the computer runs unmodified compiled code, and a "hand-optimization" run in which the codes are modified to exploit the qualities of a particular computer system and its processors.

Cray's entry improved its performance by a factor of 15 after its programmers tinkered with the benchmark codes, but it also beat supercomputers from NEC Technologies, Inc., Hitachi America Ltd. and Fujitsu Ltd. narrowly on the baseline test.

The center developed the benchmarks with the aid of Cray, IBM and, more recently, Digital Equipment Corp. Japanese supercomputer companies are also getting involved in the test-creation process, according to Cybenko.

Cray won the overall performance category by having the shortest total execution time on the 13 Perfect codes. The Cray ran the benchmark in 53 seconds, or about 3,500 times faster than a DEC VAX-11/780. The 11/780 is often used as a baseline for computer comparisons.

Stardent won the cost-effectiveness category, which the contest defined as the reciprocal of the product of the benchmark execution time and the list price of the computer used. Stardent's $123,400 model executed the benchmark in 4,350 seconds.

One of the losers, Convex Computer Corp. in Richardson, Texas, said the baseline test of its machine failed to use the automatic optimization instructions of the compiler. "We've improved our times by half" by selecting the top setting, said Convex Vice-President of Marketing Frank Vince.

However, Vince admitted that Convex, unlike Cray, had missed the deadline to deliver the "hands-on" optimized code for the contest. "We had a lot of other things to do. We had business to do," he said, adding that the company planned to participate fully in the benchmark test next year.

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Databases

FROM PAGE 25

ing relational technology to create a data-driven mentality rather than a data processing-driven mentality." The issue of SQL connectivity is being addressed by an industry committee called the SQL Access Group, Inc.

"We needed to fill in areas of the SQL specifications that were left to the vendors to define," said Jeff Jones, manager of product planning at Teradata Corp., an SQL Access member in Los Angeles. Until now, vendors have had to define gateways that linked specific DBMSs to others, such as Ingres Corp.'s gateway to IBM's DB2. Testing of the SQL Access Group's SQL is due by year's end, Jones said, and will be publicly demonstrated.

Other barriers to connectivity persist as well. Data from various databases is arrayed in different formats and has to be imported into new structures through "joins" of the data, which are arrayed in tables under relational database management system technology. Progress has been made in this area because most RDBMS vendors have user interface products that simplify preparation of SQL queries. The query results are imported into a new RDBMS structure, and data is re-assembled into new reports.

Differences in communications protocol also prevent connectivity, but some vendors attempt to circumvent those problems with software that masks the communications' complexities. Oracle's SQL*Net product allows various Oracle databases to connect to one another. Other vendors such as Sybase, Inc. sell DBMS-to-DBMS gateways linking various brands of RDBMSs together.

In the past year, software vendors have tackled many of the SQL and connectivity problems barring truly distributed database architectures, but much work still remains. As a result, distributed queries — transparent to the end user — may remain a tantalizing prospect until the mid- to late-1990s, industry analysts said.

Savage

FROM PAGE 25

The company tried to sell newer systems to its real-time customers with little luck. Since they didn't want to replace their old machines, the pressure from Interex became more effective.

While keeping the basic architecture and operating system, upgrades to the computer have been relatively difficult. It was designed on paper, without computer-aided design, and model upgrades — all four of them — were box swaps.

In the next model (pick any letter of the alphabet here, as the previous ones were named, in order, M, E, F and A) the proprietary chip set may be a board upgrade, but HP has yet to make its technology known. HP may not even know what its next model will be, as sources say its introduction may happen next year or five years from now.

Whatever research and development is working on, HP will hang on to its current Model A until the year 2000. It also plans to continue supporting it until 2010. That may delight users, but trouble HP accountants whose company would make more money by weaning users off of current systems and onto the next glitzy machine.

It's a fine line HP is trying to negotiate, and it's not just with the Model 1000s. HP does seem to listen to its users. Users rarely want to give up their investments in their systems. So HP is trying to be everything to everyone. It offers new technology but doesn't give up on the old, thus stretching its resources and maybe leading customers into blind alleys.

In 2010, some crotchety information systems director (maybe they'll be called IS czars by then) will have to deliver the news to the chief executive officer: The company has to change all of its systems overnight for a whopping sum of money. Sorry, I'm taking my retirement in Tahiti.

Savage is a *Computerworld* West Coast senior correspondent.

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Release 2 of SQLDBM and SQL Ad Hoc — a line of catalog management, SQL code generation and ad hoc reporting tools for Tandem Computers, Inc.'s Nonstop SQL — has been announced by Software Professionals, Inc.

The updated release can handle tables from Releases 1 and 2 of Nonstop SQL in a single environment. SQLDBM's price ranges from $8,000 to $32,000; SQL Ad Hoc costs between $3,500 and $14,000, depending on CPU type.

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Release 3.2 of Proalter/Plus, an integrated set of DB2 administration tools for analyzing, tuning and maintaining IBM DB2 systems, has been introduced by On-Line Software International, Inc.

The tool's SQL Alter capability allows users to add columns to a DB2 table; drop, change or add primary and foreign keys in real time; and perform bind, rebind, free and drop functions on-line, the vendor said. The product reportedly has been expanded to allow database administrators to submit DB2 commands such as start, stop and display while staying within the Proalter environment.

Proalter/Plus costs $25,000.

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Applications packages

Software Business Technology Corp. has announced a new edition to its SBT Payroll program, part of its Series Six Plus Database Accounting Library.

SBT Payroll Version 6.3 enables users to handle taxes for all 50 states without the need for state tax table modules.

The SBT Database Accounting Library runs on MS-DOS, Apple Computer, Inc. Macintosh, Unix/Xenix and VMS. SBT Payroll 6.3 for multiuser network and single-user systems sells for $595 in source code and compiled formats. A compiled single-user version costs $295.

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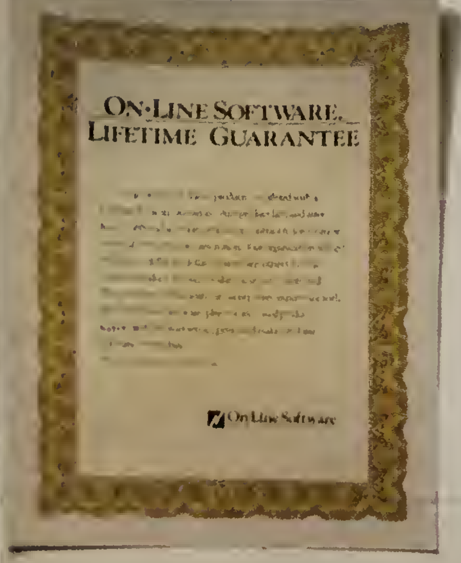

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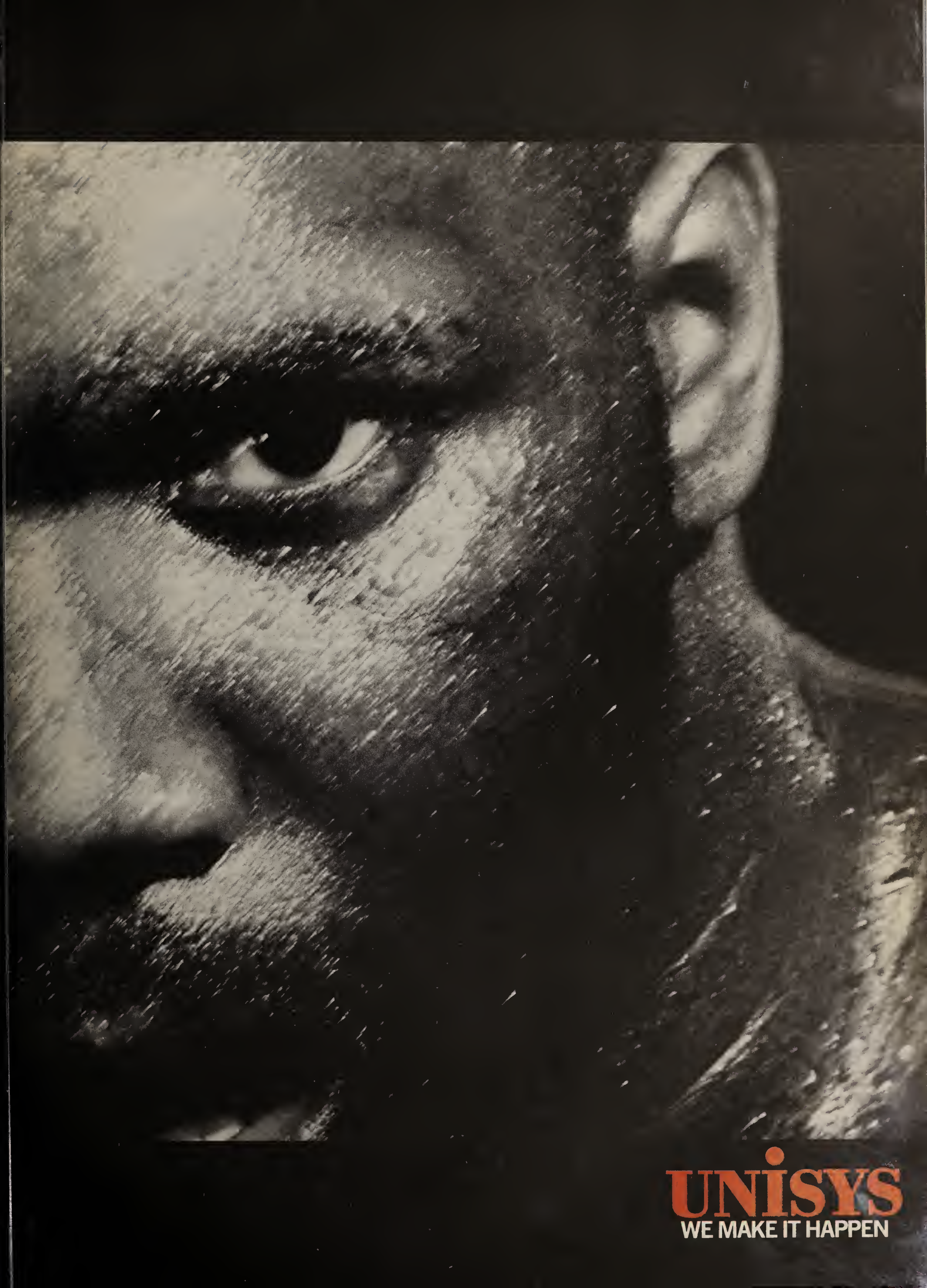

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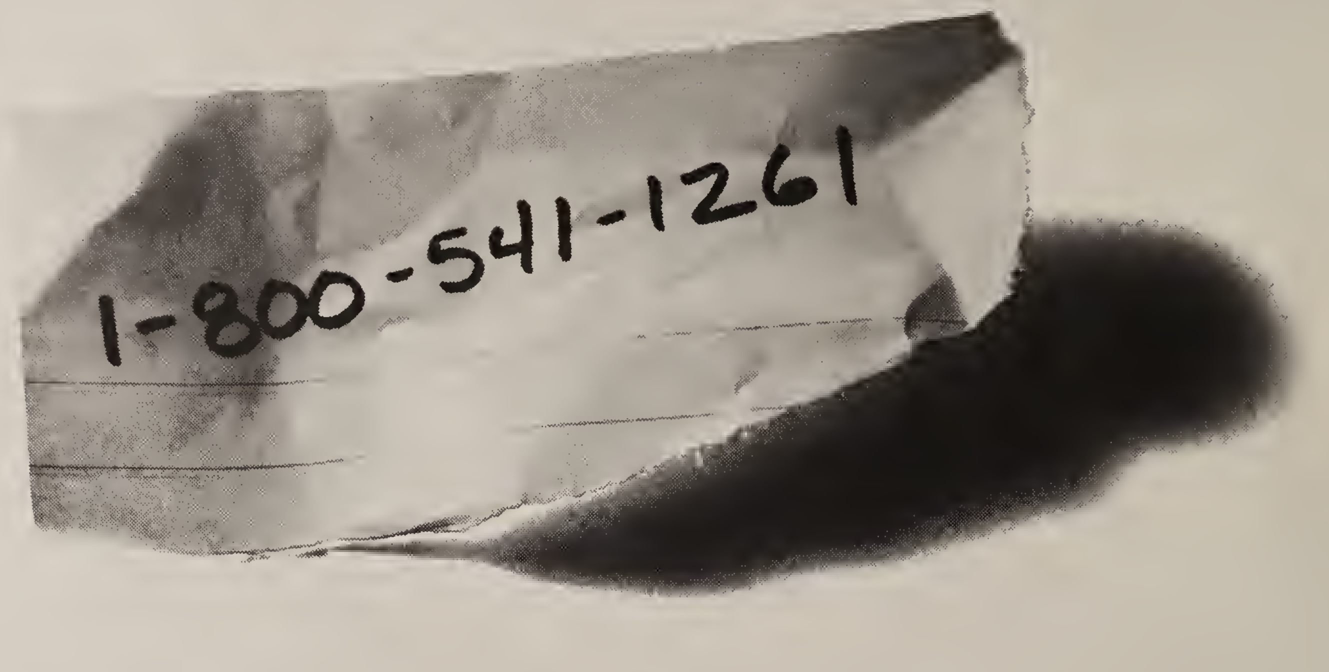

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PCs & WORKSTATIONS

MICRO BITS

Douglas Barney

PC peace train

Break out the champagne, folks. Peace is at hand. No, it's not Eastern Europe, although that's nice, too. This is a detente *The New York Times* and *U.S. News & World Report* have overlooked: the end of the silly struggle between information systems and personal computer users.

It was a long and sometimes sordid squabble with plenty of blame for everyone. Some say it was PC bigots that launched the offensive by bad-mouthing the mainframes, standards and applications backlogs of IS. PCers believed that individual users, through sheer numbers and will, would push IS down a few rungs. The more militant argued that this would be the death of IS. This view is now widely recognized as inane.

Others blame IS, which was for a while all too vulnerable. History has shown that it was painfully slow in realizing the strategic importance of the desktop, a credibility-sapping attitude that nearly destroyed the role of IS in setting overall computing standards.

IS smartened up first. It learned about PCs, set intelli-

Continued on page 39

Windows could be Apple worm

ANALYSIS

BY JAMES DALY
CW STAFF

When a rejuvenated and powerful version of Microsoft Corp.'s Windows environment arrives late next month, users of IBM-compatible personal computers are expected to sigh with delight. There will be one observer, however, who might complain of stomach cramps — Apple Computer, Inc.

If the revamped Windows 3.0 lives up to expectations, some analysts said it will not only affect OS/2 migration but could also take the wind out of the sails of Apple's Macintosh by closely imitating the Mac's classic windows-and-icons graphical user interface.

"Software drives the industry, not hardware," said Alan Paller, president of the AUI Data Graphics consulting firm in Reston, Va. "If the Mac's presentation system didn't exist, would it be a great machine? No."

While previous versions of Windows have been at best a pale imitation of the Mac's system, early beta-test users of Windows 3.0 said the new version is much improved in both graphics and features. Some analysts said this leveling of the playing field could be the deciding factor for many users, particularly those who hedge at the Mac's comparatively high price.

"As more look-alike and sound-alike products like this hit the market, people on the borderline are going to think twice about going with Apple," said Charles Rothchild, an analyst at the Jersey City, N.J., office of Pershing & Co.

Currently, many major Macintosh developers are working on Windows-based versions of their software, and three of the top sellers have already made the switch: Microsoft's Word for the word processing market, Aldus Corp.'s Pagemaker for the desktop publishing arena and Computer Associates International, Inc.'s Cricket Presents in the presentation graphics area.

Apple, however, is not ready to roll over and play dead. A spokesman said Apple continues to extend the value of its system with added software such as Hypercard, which is used to create customized files and includes an easy-to-use database. The Cupertino, Calif.-based company is also planning to deliver an upgrade to its operating system by the fall. System 7.0 is expected to provide a broad array of enhancements, including improved communications among various programs.

Some also argue that the functional and graphical similarities between the Windows and Mac presentation systems are more in Microsoft officials' heads than on the screen.

"There's still an enormous difference between what the

Continued on page 40

Desktop publishing sends hourly newspaper airborne

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The "nation's first hourly newspaper" debuted last week for travelers on the Pan Am shuttle, thanks to a desktop publishing system that was built for speed.

The Latest News is a magazine-size afternoon newspaper that is revised each hour — much like a radio news broadcast — and distributed to passengers on Pan American World Airways' shuttle flights between Washington, D.C., New York and Boston. "Our theory is simple: We think you've been in a news blackout during the last several hours and would love to know what's been going on around the world," wrote founder Leland Schwartz in the 13-page first edition.

Production begins at the offices of States News Service in Washington, D.C., where editors select reports from United Press International's high-speed news feed, and ends when couriers deliver the papers to Pan Am's airport gates.

The desktop publishing system involves two Intel Corp. 80386-based personal computers that were custom-built by Schwartz's brother Andrew, owner of a local technical support firm called PC Help. *The Latest News* uses Aldus Corp.'s Pagemaker software for layout and a Hewlett-Packard Co. Laserjet II for the camera-ready copy.

In order to speed up the desktop publishing process and meet those hourly deadlines, the system also uses a raster-image processor board from Lasermaster, Inc., based in Eden Prairie, Minn. Andrew Schwartz said the device increases the speed of the Laserjet output, especially on graphics, and boosts the resolution.

The Lasermaster produces output with a resolution of 800 by 800 dot/in. and makes the Laserjet print pages about 10 times faster than normal, according to Lasermaster's local dealer, Applied Intelligence Group Co. in Alexandria, Va.

Andrew Schwartz said the PCs were configured for speed and reliability, which included the use of 386-based motherboards from Hauppauge Computer Works, Inc. in Hauppauge, N.Y. The Hauppauge boards "are a bit more expensive than the average 386 motherboard but a whole lot more reliable," he said.

The experimental newspaper, with a circulation of about 175 copies hourly, is a joint venture of States News Service, UPI and the magazine *Financial World*, which sells advertising. *The Latest News* can also be transmitted by fax to land-bound readers.

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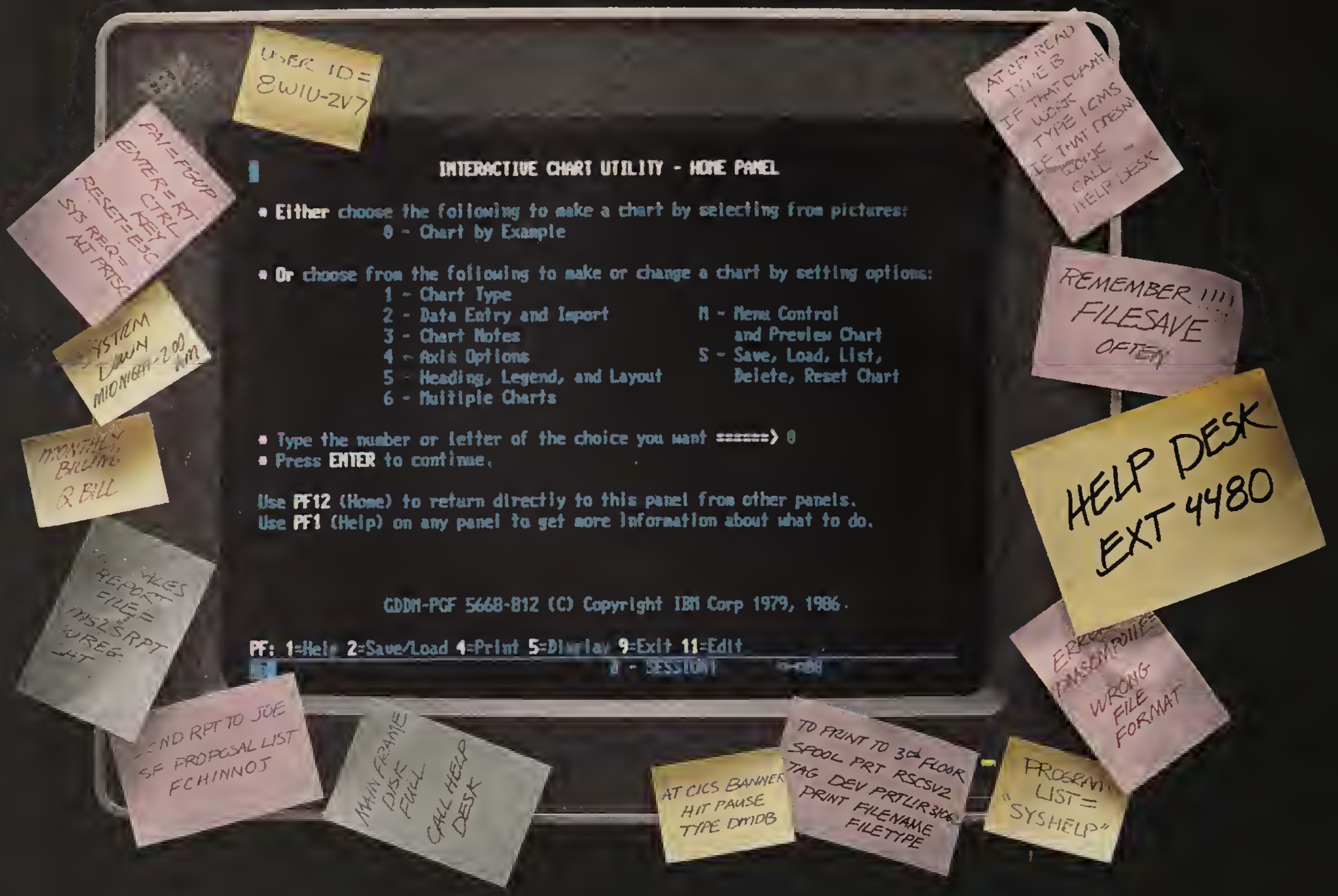

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           2 - Data Entry and Import           M - Menu Control
           3 - Chart Notes                         and Preview Chart
           4 - Axis Options                    S - Save, Load, List,
           5 - Heading, Legend, and Layout         Delete, Reset Chart
           6 - Multiple Charts

 • Type the number or letter of the choice you want ======> 0
 • Press ENTER to continue.

 Use PF12 (Home) to return directly to this panel from other panels.
 Use PF1 (Help) on any panel to get more information about what to do.


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 PF: 1=Help 2=Save/Load 4=Print 5=Display 9=Exit 11=Edit
```

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[ 2 ]   DOWNLOAD SALES DATA
[ 3 ]   VIEW WEEKLY SALES GRAPHS
[ 4 ]   UPDATE SPREADSHEETS
[ 5 ]   WORD PROCESSING

Please enter selection
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Bar association paves automation road for peers

ON SITE

BY RICHARD PASTORE
CW STAFF

CHICAGO — By some accounts, the legal profession is as much as a decade behind the banking and insurance industries in its level of automation (see related story). But the American Bar Association (ABA) hopes to lead by example as it pulls the plug on its minicomputer system and powers up PC-based local-area networks.

The ABA, situated on the south shore of Lake Michigan, plans to migrate from a 650-terminal Wang Laboratories, Inc. dual VS 300 office system to several personal computer-based LANs. The rationale is twofold: reliability and economics.

Because the ABA is made up of dozens of diverse work groups doing their own thing on their own schedule, "I can't tell what any of my users are doing; any time may represent crisis deadline work," admitted Jay Ammerman, assistant executive vice-president of the information systems and technology group. Consequently, downtime at any point is likely to be a disaster for someone. "I'm very vulnerable for reliability, so I needed to look for an option to get away from the dependency on the minicomputer," Ammerman said.

Because of the LAN's local nature, when a particular server fails, it will have less broad an impact on the ABA's staff of 800.

The second motivation was cost. "Moving to a LAN solution [vs. a mini] will result in less expense to the ABA and the user," said Ammerman, whose department charges back expenses to the user departments. He estimated that in the first year of implementation, the savings will amount to $160,000 to $170,000.

Ralph Finn Hestoft

The Bar's Ammerman *directs the group's cost-effective migration to PC-based LANs*

Such savings over time will be important for the not-for-profit ABA, which is supported primarily by dues from its 360,000 members. "Because of the competition for dues, we have to be very careful about where our dollars are going in managing IS," Ammerman said.

The migration is set to start with the September opening of a satellite site six blocks from ABA headquarters. The new site will be configured first, with LANs linking 110 workstations.

The ABA's Washington, D.C., site will follow, where 115 nodes will be linked to an undetermined number of servers. Finally, the headquarters will migrate its 450 terminals off the Wang processor. The causious ABA will stretch the process out over four years.

The fate of the Wang hardware is currently in doubt. "We may find other uses for the mini," Ammerman speculated. The decision to switch to LANs was hastened but not prompted by Wang's recent troubled fortunes, he noted.

Ammerman expects to tie the remote locations together via dedicated telephone lines. He also anticipates patching the LANs to the IBM 4381 host for administrative tools via 3270 gateways and possibly to the Wang mini via terminal emulation. Responses to the request for proposals are due this month.

Meanwhile, the ABA is experimenting with small LANs. Its membership publication, *The ABA Journal*, has been produced on a 13-node LAN made up of AST Research, Inc. workstations and Acer, Inc. servers since January.

Because word processing is the ABA's primary desktop application, Ammerman does not anticipate buying node machines more powerful than Intel Corp.-based 80286s. "If vendors recommend 386s or OS/2, they're going to have to tell me why; what's the benefit? When I look at PCs for workstations, I tend to look at a $3,000 figure."

Tough sells

Though the American Bar Association is progressive enough to hitch up to the local-area network bandwagon, the same cannot be said of many of its 360,000 member attorneys.

"The legal profession is five to 10 years behind insurance and banking" in its level of automation, estimated Jay Ammerman, assistant executive vice-president of the ABA information systems and technology group.

The reason? Attorneys' training makes them a tough sell. "Their legal training prepares them to find all the reasons why something won't work," Ammerman said. "That type of approach to information puts a difficult slant on their willingness to accept new things."

About 90% of law offices have some sort of automation, but it is unclear how many attorneys actually have hands-on access, according to ABA studies.

Because law is not as transaction-intensive as some other professions, "there is a less-compelling reason for why attorneys should be interactive with the system," Ammerman admitted.

Yet there is a definite trend toward increased involvement and more sophisticated systems. The driving force is new lawyers, who became comfortable with computers as students. "As young attorneys come in, they wonder why the equipment isn't there and where's the support," Ammerman noted.

RICHARD PASTORE

Micrografx rebounds with product push

BY PATRICIA KEEFE
CW STAFF

DALLAS — After a slight downturn in January, graphics software publisher Micrografx has not only rebounded with several product introductions but is also expected to be among the swarm of developers announcing Microsoft Corp. Windows 3.0 support on May 22.

In addition, the company is said to be gearing up for an initial public offering.

Most recently, the company delivered two products, including the belated Designer 3.0 and Xport, while also introducing the Overnight Slide Service for Designer via Magicorp, a service bureau.

Failure to deliver Designer 3.0, increased competition and retrenchment in the reseller markets together managed to derail fourth-quarter sales and contributed to a decision to lay off 20% of its work force — 40 employees — in January. However, as Chief Executive Officer Paul Grayson pointed out, the company was and is profitable.

According to Grayson, the staff cuts were supplemented by a reassessment of sales projections. Those estimates could get a boost from recent product introductions.

Added surprises

Designer 3.0 is now shipping and includes features not initially announced, including color autotrace, more than 1,700 free Clipart images, a Bezier Drawing tool and extended memory support for up to 16M bytes on Intel Corp. 80286-based computers.

In addition, Designer 3.0 offers outline font support, color-scanned image support, new line styles, joins and caps, image masking, electronic slideshows, Telegrafx Imagin Center driver, Clipart preview, a large bitmap capacity and enhanced color separation tools. Also provided are Apple Computer, Inc. PICT and Digital Research, Inc.'s GEM Import and Export.

Registered users can upgrade for $99. Customers who purchased Designer after Oct. 1, 1989, can get a free upgrade. The product retails for $695.

Xport retails for $395 and translates graphics files across formats. Supported applications include Lotus Development Corp.'s Freelance, Autodesk Inc.'s Autocad, Claris Corp.'s Macdraw, Digital Research's Gemdraw and Artline and SPC's Harvard Graphics. Supported formats include Computer Graphics' Metafile, Autocad's DXF, Apple's PICT1 and 2, GEM and Micrografx's Drawing.

Grayson claimed Xport gives users of most graphics programs unlimited access to graphics, electronic art and clip art.

"Users with a substantial investment in images in one format will be able to use them in the graphics applications of their choice."

The Overnight Slide Service for Designer is said to allow users of Micrografx's recently introduced Telegrafx communications utility to send Designer 3.0 files to Magicorp via modem or on diskette for conversion into 35mm slides and overnight delivery. Color overhead transparencies, color photo prints and color laser prints are also available. Prices start at $10 per slide.

IBM gussies up aging, yet venerable Displaywrite

BY PATRICIA KEEFE
CW STAFF

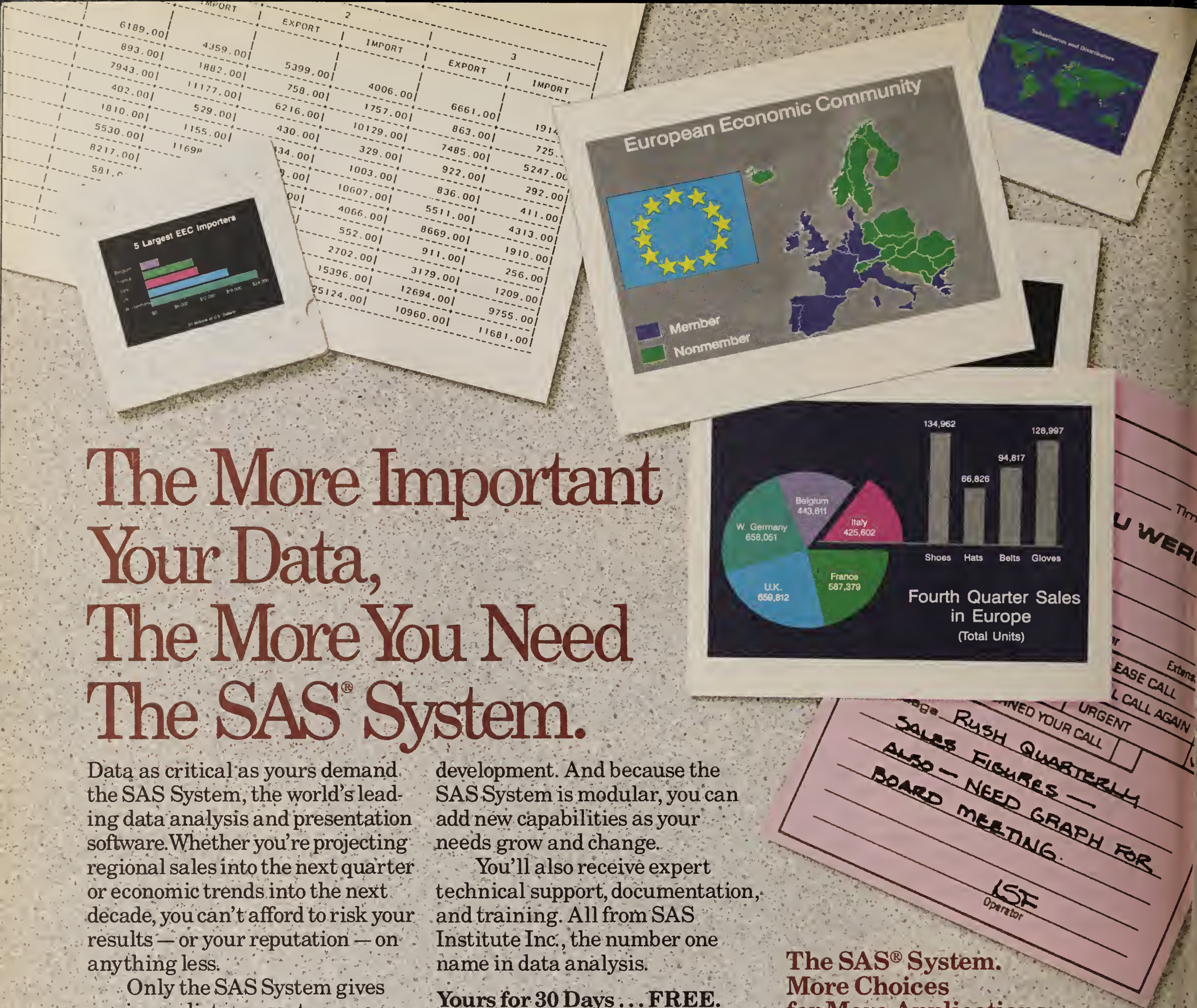
WHITE PLAINS, N.Y. — IBM last week unwrapped the latest generation of its flagship word processing package, Displaywrite 5 for DOS. Key enhancements include advanced text-handling capabilities and what-you-see-is-what-you-get page preview capabilities.

Other additions to the venerable word processor include typographic font support, a command line feature enabling menu bypass, split-screen editing capabilities, enhanced list services and advanced merge capabilities, as well as support for popular local-area networks.

Displaywrite does not always get the attention accorded Microsoft Corp.'s Word, Wordstar International's Wordstar or Wordperfect Corp.'s namesake word processor, but it does have a sizable market share. According to Nancy McSharry, a software analyst at market research firm International Data Corp. in Framingham, Mass., Displaywrite trails only Wordperfect and Wordstar in installed base as of late 1988.

Fernand Sarrat, vice-president of IBM Desktop Software, said Displaywrite 5 represents a direct response to customer requests.

The $495 package is backward-compatible with all Displaywrite files, including the OS/2-based Versions 5/2 and 5/2 Composer. It requires a personal computer based on Intel Corp.'s 80286 at minimum and is available now. Upgrades for users of Displaywrite 3 or 4 are available for $95.



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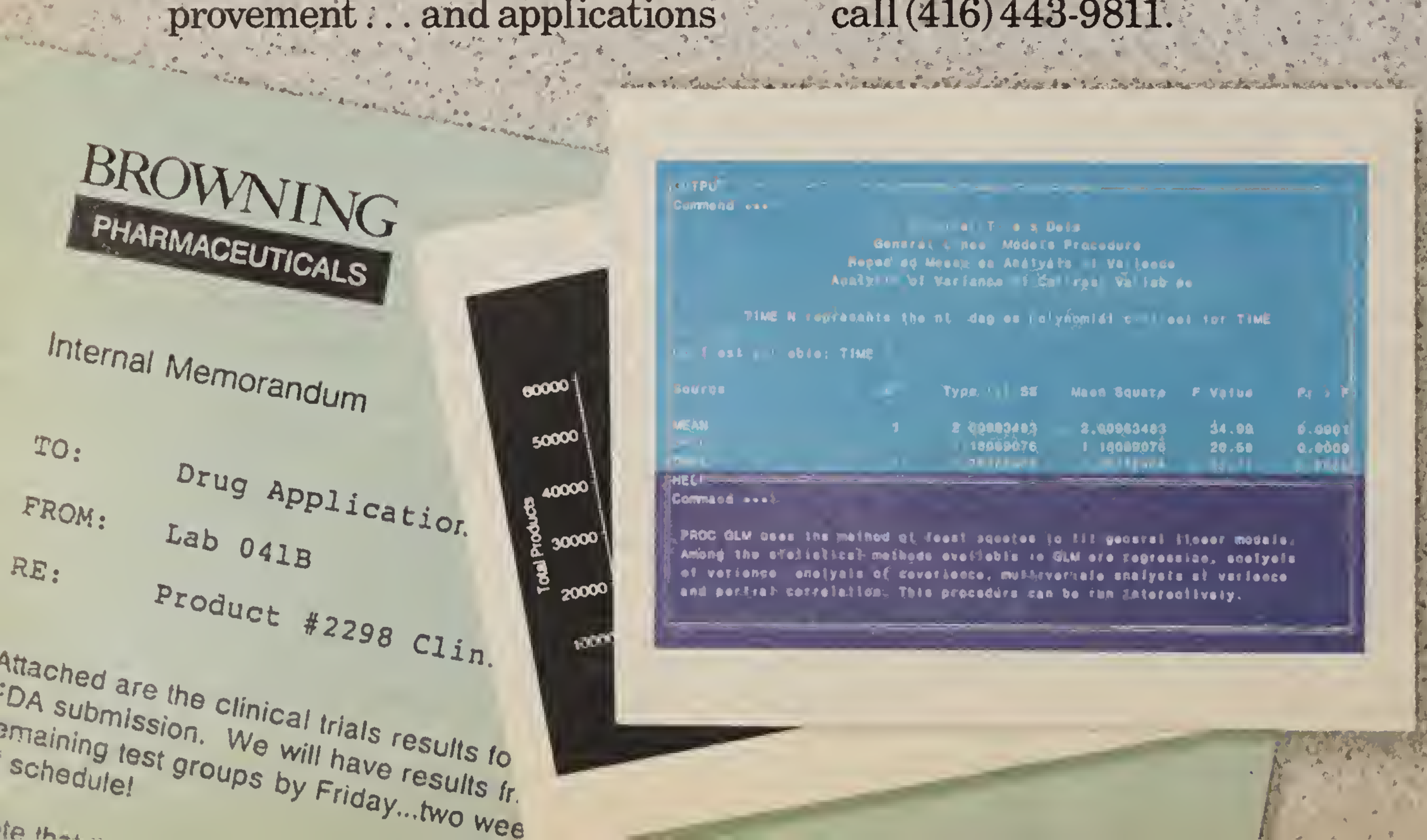

BROWNING
PHARMACEUTICALS

Internal Memorandum

TO: Drug Application

FROM: Lab 041B

RE: Product #2298 Clin

Attached are the clinical trials results fo FDA submission. We will have results fr remaining test groups by Friday...two wee schedule!

Barney

FROM PAGE 35

gent hardware and software standards and made itself generally useful.

For some PC users, though, it was too late. In too many cases they had gone it alone, only to find themselves strapped to systems that don't work and have no future. Now the once-renegade users are begging for help from IS.

That is not the only reason for the IS desktop resurgence. Dramatic shifts in technology have left individual users irritated, confused and frightened. The whiz at Lotus macros, for instance, shudders or shrugs when you say LU6.2. Now that this stuff is important, PC users are crying for help.

PC users, who used to hate the mainframe and snubbed IS, now seek access to corporate data. And their PCs now play a role in keeping that data fresh.

All the things that PC users are now excited about are beyond their scope. Networking, for one thing.

If IS pros were mean, they would say "I told you so." By and large, though, IS folks are happily coming to the rescue, helping PC users discover a whole new way of computing.

One thing users want is a more robust way of organizing and accessing shared data. Vendors have been kind enough to create database servers, which are essentially hybrid mainframe DBMSs that fit on a micro. However, these systems require mainframe DBMS-style expertise. Knowing a few Dbase commands doesn't cut it.

PC users are also getting excited about Unix workstations. There's nothing like having a Sun, Next or HP workstation to talk about at the weekend cookout. Better call your friendly neighborhood IS pro if you're serious about one of these doggies.

And while many users still think cooperative processing means saying "please" when borrowing a disk, IS is hard at work creating shared processing systems.

IS expertise has also saved users from a number of serious errors. It was IS that evaluated Dbase IV and told users to wait for more stable versions. It was IS that evaluated OS/2 and told users to wait for more applications. If users want a reliable, supported, cost-effective system, they'd best go to IS.

There is a risk to IS' newfound respect. Now everyone wants a slice of IS' time. The guy with a system crash and a report to the president due in an hour is not exactly patient. But we have confidence.

Barney is editor in chief of *Amiga World.*

MICRO NOTES

Compaq Deskpro 286 lives on in 286E

Though **Compaq Computer Corp.** discontinued its Deskpro 286 line, users will still be able to buy Intel Corp. 80286-based machines from Compaq in the form of the Deskpro 286E. These feature a smaller footprint than the discontinued Deskpro 286 line.

Informix Software, Inc. has inked a pact with **IBM** giving IBM the rights to market and sell Informix applications that run on IBM's AIX-based hardware platforms.

Microsoft Corp.'s Japanese subsidiary recently unwrapped VGA Kanji Windows, a developer's kit said to allow U.S. Windows developers to easily port their applications into Japanese.

Following a February agreement to sell its top-selling Superport 286 laptop computer through Sears, Roebuck and Co.'s "Brand Central" home electronics stores, **Zenith Data Systems** recently announced that it will make its Minisport notebook computer available through larger **Montgomery Ward and Co.** "Electric Avenue" home electronics departments.

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FCC grasping at shielding-law straws

BY J. A. SAVAGE
CW STAFF

Personal computer users reaching for top power in their homes are making it increasingly difficult for the Federal Communications Commission to enforce rules requiring extra radio wave shielding on home computers, while leaving business computers alone.

Determining the difference between personal and business computers "is very hard and has gotten harder," said Bob Ungar, attorney for the FCC's Office of Engineering and Technology.

A computer with an Intel Corp. 80386 processor used to be considered "clearly not a PC," said Wayne McKee, chief of the management and legal assistance branch of the FCC. Thus, older 386-based computers were not required to have radio wave shielding. Now the enforcement staff takes the opposite view.

The FCC is concerned about radio wave shielding, not for the health of the user, but for the potential of interference with television and radio transmissions. A business class computer is not considered a threat to interference because businesses tend to be segregated from television and radio end users, according to Ungar.

Warnings issued

Many companies, such as Wang Laboratories, Inc., Advanced Logic Research, Inc. and Samsung Electronics Co. Ltd., have been warned or fined by the FCC for selling unshielded personal computers.

Advanced Logic, for instance, had marketed its computers to businesses. When notified of an apparent violation on two of its models, the company halted sales and is currently putting them through the FCC's testing procedure, according to a spokeswoman.

There are no firm definitions for personal (Class B) and business (Class A) computers for the FCC. When the rules were first made in 1980, the agency looked at size, price and how the computers were marketed, according to Ungar. He said that size and price are still indicators but much less so. "We're left with how the thing is marketed," he said.

Caught with technology speeding past its old rules, the FCC was supposed to try updating its definitions of computers last year. "But frankly, it was too tough," Ungar said. He added that the agency would try again this year.

Nothing but static

Random samplings made of home computers by the Federal Communications Commission in 1986 found 75% emitted radio frequency waves in violation of FCC standards. Radio frequency emissions were once considered part of health threats from computers but are now considered too weak to affect users.

However, the relative strength or weakness of the frequencies measured by the FCC, as well as other criteria for the sampling and the manufacturers that flunked the FCC's tests, have not been made public, despite repeated requests by *Computerworld* during the past 18 months.

The FCC only sampled Class B computers, those marketed for personal use, during 1986. Class A computers, for business and industrial use, do not have to file with the FCC, although the commission retains an option to test the computers, according to Randy Ortanez, an electrical engineer in the FCC's lab in Maryland who tested the Class B computers.

Since 1986, money has not been available from the federal budget for continued sampling, according to Art Wall, chief of the sampling and measurement branch for the FCC.

The FCC, according to lawyers and staff at the agency, does not test for radio frequency emissions because they are a potential health hazard; instead, they are measured for their potential to interfere with television and radio communication.

Radio frequency waves are "very high-frequency emissions," said David Charron, a project scientist at the Canadian Center for Occupational Health and Safety. "We're concerned with lower frequency, but stronger waves." Radio and television equipment is sensitive to high-frequency weak emissions.

While refusing to divulge the names of companies that flunked the FCC's testing, Jerry Freeman, coordinator for computer marketing enforcement, did say that "most which radiated extensively were offshore types of manufacturers."

Despite the fact that results of the sampling have not been made public, the sampling for radio wave emissions for their interference in TV reception is ironic, said Lou Slesin, editor of "VDT News." "It shows where the American public's priorities are," he said. "If you interfere with their TV, they get crazy. But if you irradiate computer workers, no one [cares]."

J. A. SAVAGE

Windows

FROM PAGE 35

Mac now offers and what Microsoft may or may not have on the horizon," said Joel Orr, chairman of Orr Associates, Inc., in Great Falls, Va. "To the unsophisticated user who is only going to use three or four basic functions, Windows will be fine. But to someone like a software developer, Windows is still a nightmare," he added.

The updated Windows is also far from a sure thing. Even if Windows 3.0 is released in May, it will take months for a volume of products to emerge.

Also in Apple's favor is the fact that Windows 3.0 fails to attack what some analysts have called Apple's Achilles' heel: the lack of a low-cost Macintosh. Low-end PCs may be cheaper than a $1,500 Mac Plus, but they lack Windows.

Windows 3.0 is reportedly a memory hog. Microsoft officials confess that users may need up to 4M bytes of random-access memory to fully exploit the capabilities of the program — far more than the typical low-end user employs — and mass memory upgrades can be costly.

After the smoke clears, Apple and Microsoft may have wound up only bloodying each other. Apple is expected to try to stem the shift to PC-based platforms through the introduction of lower cost machines. However, lower prices will also cut into Apple's already plummeting profit margins, Paller added, and lower profit margins mean less research and development and less chance of a popular new product.

Microsoft, meanwhile, is expected to pump an enormous amount of time, effort and money into Windows.

Ultimately, there will be only one winner: the user, who can choose functions and low cost, Paller said.

Graphics field looks to future

BY JAMES DALY
CW STAFF

ANAHEIM, Calif. — In the shadow of Disneyland — the spiritual home of the computer graphics industry — more than 35,000 people crammed the National Computer Graphics Association's (NCGA) 11th annual conference recently to draw up a flight plan for an industry that experts said is on the launching pad.

"Where do we go now that we've arrived?" Hewlett-Packard Co. Vice-President Lewis Platt asked only a few steps from where Walt Disney made the world believe a mouse could talk.

Platt spelled out a list of technical challenges that must be met in order to exploit the potential of a market that is expected to generate $22 billion in revenue this year, according to NCGA estimates.

A key goal will be to meet user expectations of photorealism. "Until the images we see on screen are as real or better than what we see with our eyes, we've got work to do," Platt said during his keynote address.

The engine driving such resolution is going to be increased processing power, he said. The doubling of resolution in a three-dimensional model, for instance, can require twice the computational performance as well.

Platt said he foresees greater reliance on technologies such as parallel processing as well as chips that integrate either a very large scale integration (VLSI) or reduced instruction set computing (RISC) design. VLSI chips pack more than 10,000 transistors, while the RISC microprocessor architecture allows a significant uptick in performance by using fewer instructions to perform the most basic or frequently requested tasks.

Fear of standards

Platt said the collective dreams of the industry — video integration, more powerful imaging and design packages — won't be met without more widely accepted graphics standards, which he said some vendors fear. "We need to stop reinventing the wheel," Platt said. "Standards only define an interface, not how you implement it."

One bright standards-related spot at the show was the unveiling of a package that gives users a consistent way to measure how fast graphics derived from their applications can be displayed on different hardware platforms. The Picture-Level Benchmark was funded by 12 vendors including Digital Equipment Corp., IBM, Sun Microsystems, Inc., Alliant Computer Systems Corp., Silicon Graphics, Inc. and Intergraph Corp.

Analysts also said that work needs to be done outside of the laboratories. The advent of multimedia, one of the great aspirations of the industry, could be severely slowed because of a lack of trained professionals. "Design schools train at least 10 and possibly 100 traditional graphics artists for every one they train to combine animation and sound," said Alan Paller, president of AUI Data Graphics, a consulting firm in Reston, Va. "It's a wonderful technology, but it's not going to be used by all of us folks unless that changes."

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NEW PRODUCTS

Systems

Systems Management American Corp. has introduced the SMA 386 microcomputer.

The product provides up to 32-bit Intel Corp. 80386 functionality and offers a small footprint system designed for performance in standard office environments, the vendor said.

The 386 supports Unix, OS/2 and DOS operating systems, as well as Microsoft Corp.'s Windows 386. Its memory can be expanded to 32M bytes.

Pricing ranges from $2,218 to $3,600, depending on configuration.

SMA
254 Monticello Ave.
Norfolk, Va. 23510
804-627-9331

Software applications packages

Computer Associates International, Inc. has introduced two integrated desktop graphics software products for Microsoft Corp.'s Windows platform.

CA-Cricket Presents and CA-Cricket Graph incorporate features of Xerox Presents and Xerox Graph, two products acquired by CA as part of an agreement with Xerox Desktop Software in February.

Both products can run on an IBM Personal Computer, Personal System/2 or compatible with an Intel Corp. 80286 or 80386 microprocessor and require a mouse, 1M byte of random-access memory and a floppy or hard disk drive, the vendor said.

Suggested retail prices for CA-Cricket Presents and CA-Cricket Graph are $495 and $195, respectively. Both products are scheduled to be available next month.

CA
711 Stewart Ave.
Garden City, N.J. 11530
516-227-3300

Wordperfect Corp. has begun shipping Drawperfect 1.0, a business presentation graphics software package that enables users to create visual aids, which are compatible with Wordperfect 5.0 and 5.1.

Features include Wordperfect text editing, 25 built-in fonts and a full set of graphing functions. The product requires 384K bytes of free memory and two high-density disk drives; a hard disk is also recommended, the vendor said.

The software package is available as a stand-alone or network server package for $495. Additional network station packages are available for $295.

Wordperfect
1555 N. Technology Way
Orem, Utah 84057
801-222-4437

Great American Software, Inc. has announced an upgrade to its One-Write Plus accounting software family.

Version 2.06 can run on any personal computer and includes Supertrack, a pop-up database that enables users to organize and track information according to their business needs. Files within Supertrack can be customized (renamed) without the need for additional programming, the vendor said.

Other features include budgeting, bank reconciliation and speed search. Quick setup and laser printer support are also offered.

Version 2.06 costs $299.

Great American Software
P.O. Box 2066
615 Amherst St.
Nashua, N.H. 03063
603-889-5400

Software utilities

Varteck International, Inc. has introduced a new version of its point-and-shoot software menu interface for hard-disk users.

Users of such menu systems as Delta Technology, Inc.'s Direct Access, Magee Enterprises, Inc.'s Automenu, IBM's Fixed Disk Organizer and Wordperfect Corp.'s Wordperfect can convert their menus and upgrade their software to PS-Menu without having to set up their computers again, the vendor said. The PS-Menu family includes PS-Net for use in networks and PS-Lock, a maximum security menu with virus protection.

PS-Menu costs $75; prices for PS-Net and and PS-Lock are $295 and $195, respectively.

Varteck
3 Regent St.
Livingston, N.J. 07039
201-740-1750

Above Software, Inc. has introduced a utility that gives DOS users control of a personal computer's conventional, extended and expanded memory.

Above Disc Version 3.1 features a hard-disk spillover with disk caching for efficient hard-disk emulation. It enables users to increase memory from 640K bytes to 736K bytes on systems equipped with IBM's Enhanced Graphics Adapter/Video Graphics Array adapters and to move Novell, Inc. local-area network drivers to extended memory to provide 36K bytes of random-access memory.

The $119 price tag includes both 3½- and 5¼-in. media.

Above Software
3 Hutton Centre
Santa Ana, Calif. 92707
714-545-1181

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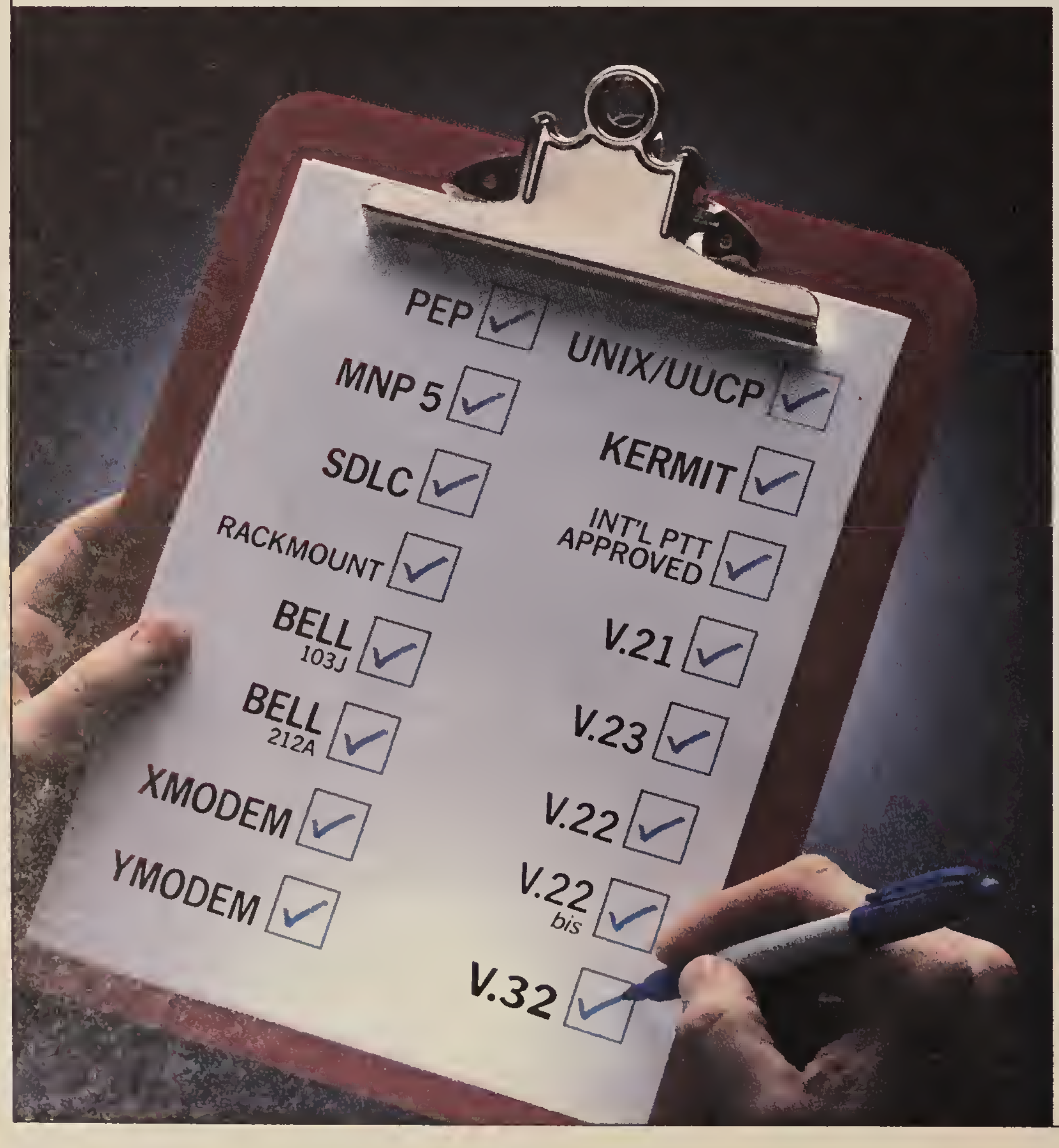
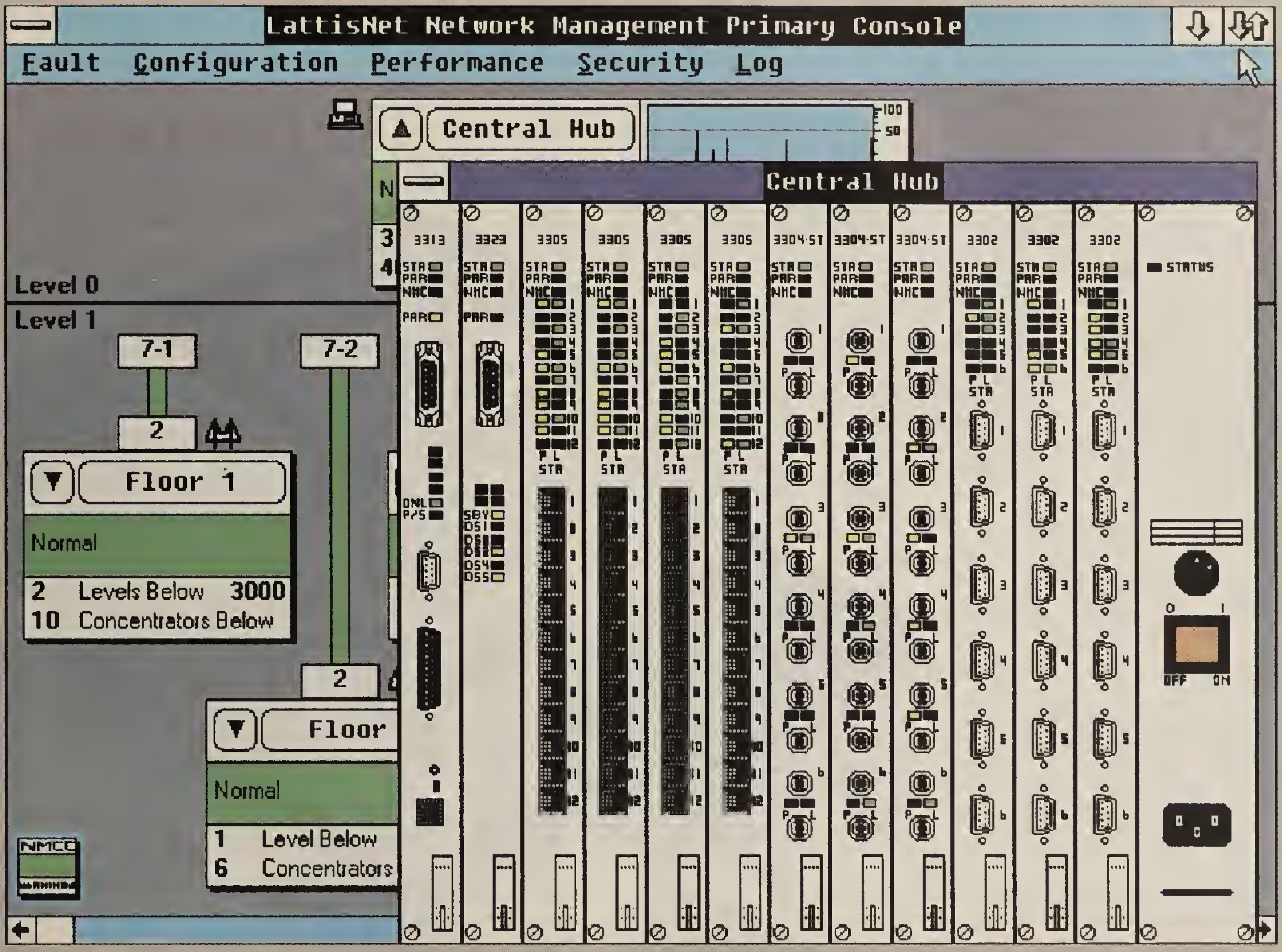


MAXIMIZE NETWORK UP-TIME



The expanded view features a detailed, real-time display of a LattisNet System 3000 concentrator.

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LattisNet Network Management lets you learn about the network from the network itself. User-definable thresholds let you determine acceptable activity and error levels for the network. If a threshold is crossed, the system alerts you immediately, keeping you one step ahead of potential problems. And best of all, LattisNet Network Management captures and stores vital information for future analysis and network planning.

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SynOptics Communications, Inc., Dept. 600, 501 East Middlefield Road, Mountain View, CA 94043-4015 (415) 960-1100

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There are a couple of reas

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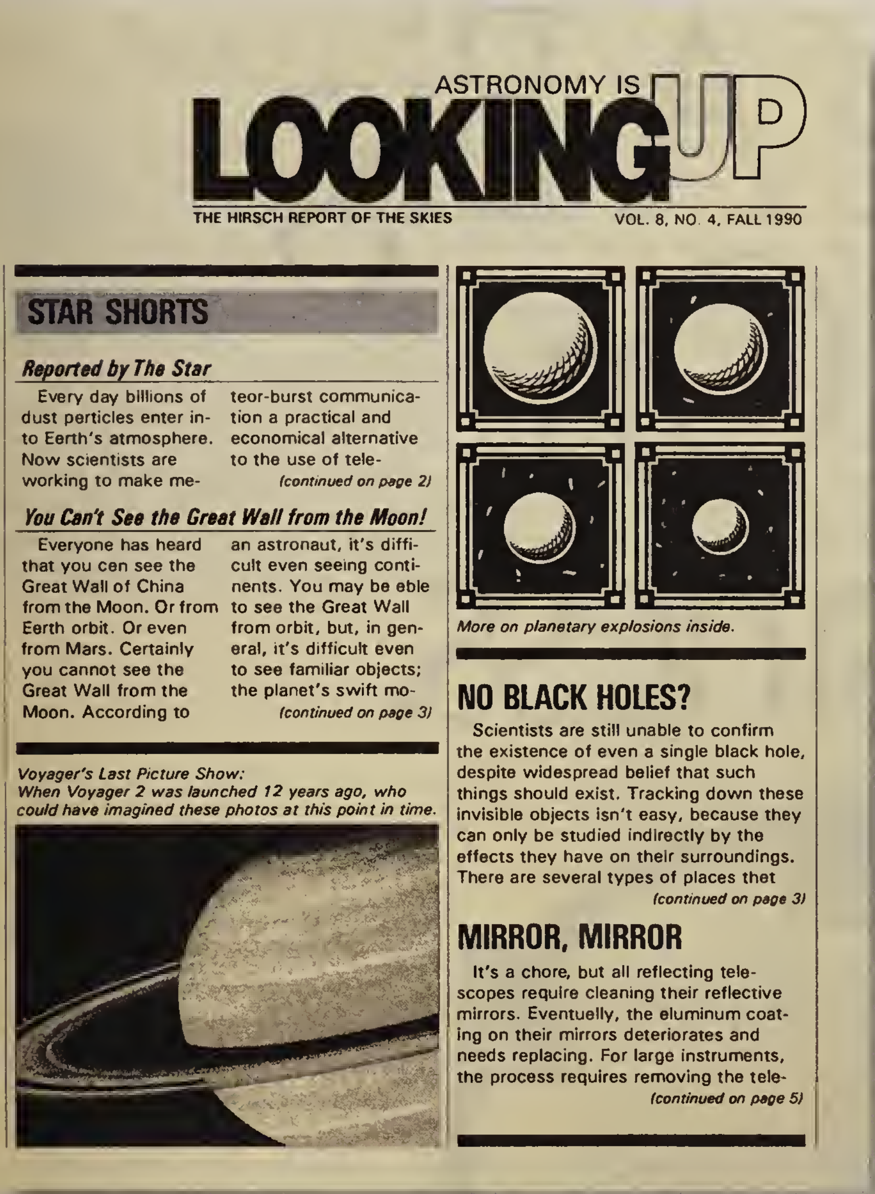
ons to buy the new HP LaserJet III.



ASTRONOMY IS
LOOKING UP
THE HIRSCH REPORT OF THE SKIES
VOL. 8, NO. 4, FALL 1990

STAR SHORTS

Reported by The Star

Every day billions of dust particles enter into Earth's atmosphere. Now scientists are working to make meteor-burst communication a practical and economical alternative to the use of tele-

(continued on page 2)

You Can't See the Great Wall from the Moon!

Everyone has heard that you can see the Great Wall of China from the Moon. Or from Earth orbit. Or even from Mars. Certainly you cannot see the Great Wall from the Moon. According to an astronaut, it's difficult even seeing continents. You may be able to see the Great Wall from orbit, but, in general, it's difficult even to see familiar objects; the planet's swift mo-

(continued on page 3)

Voyager's Last Picture Show: When Voyager 2 was launched 12 years ago, who could have imagined these photos at this point in time.

More on planetary explosions inside.

NO BLACK HOLES?

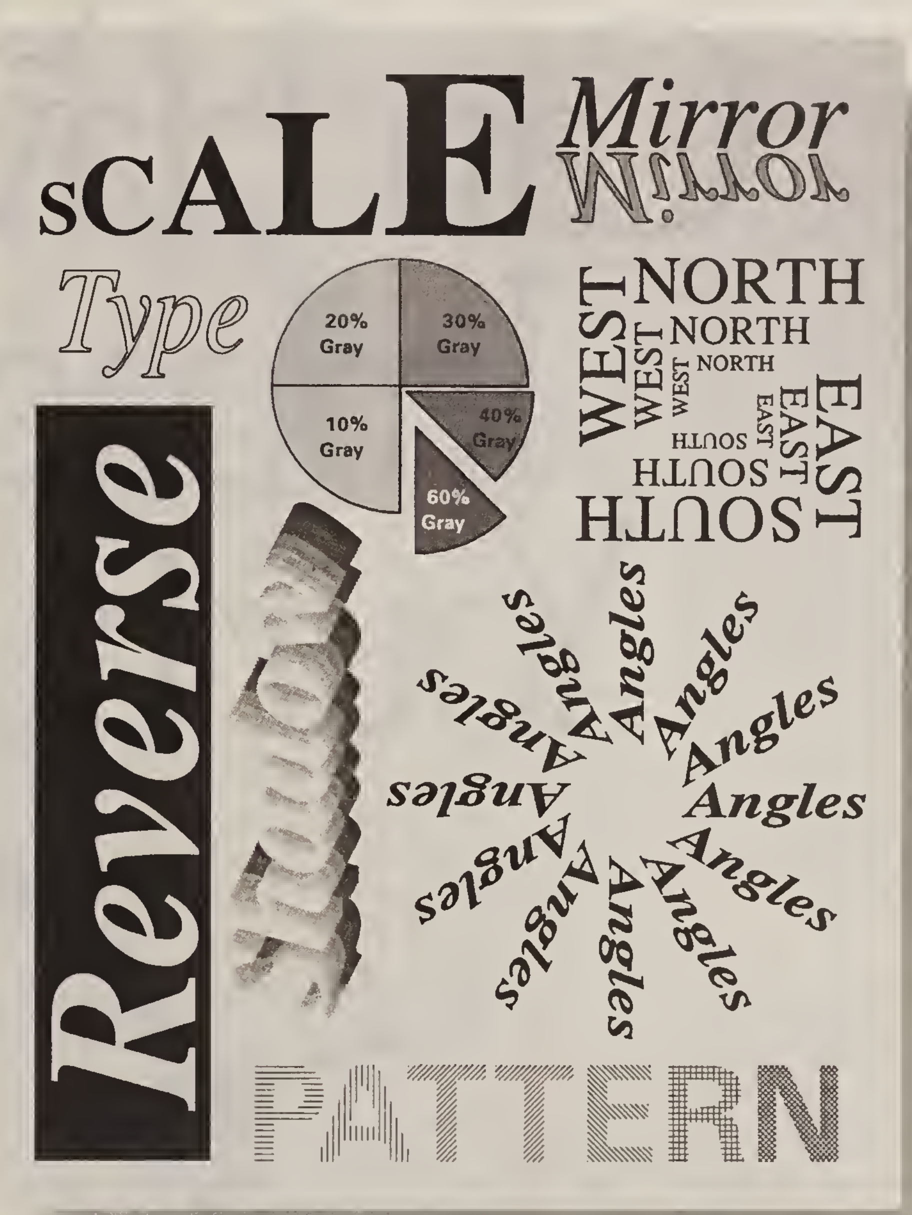
Scientists are still unable to confirm the existence of even a single black hole, despite widespread belief that such things should exist. Tracking down these invisible objects isn't easy, because they can only be studied indirectly by the effects they have on their surroundings. There are several types of places that

(continued on page 3)

MIRROR, MIRROR

It's a chore, but all reflecting telescopes require cleaning their reflective mirrors. Eventually, the aluminum coating on their mirrors deteriorates and needs replacing. For large instruments, the process requires removing the tele-

(continued on page 5)



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NETWORKING

DATA STREAM

Jeffrey N. Fritz

A pleasure being home

Complications seem to happen at the worst possible times. You promised to have the updated sales module completed for your largest customer in Los Angeles. With the deadline at hand, a major snowstorm hit last night. You were able to make it in with your four-wheel-drive vehicle early this morning, but your lead systems analyst can't get out of his door. How are you going to get the updated module completed on time?

If this scenario seems familiar, residential Integrated Services Digital Network may someday come to your aid.

Recently, my home received ISDN, with some rather startling results. Like many professionals, I do a considerable amount of work at home. Carrying floppy disks in my briefcase or using my excruciatingly slow modem has been a frustrating and often counterproductive experience. Consequently, I volunteered my home as a test location to determine whether West Virginia University faculty and staff would benefit from residential ISDN service.

ISDN began paying me dividends almost immediately. The first benefit was improved mainframe access. Connectivity leaped from 1,200 bit/sec. to 9.6K bit/sec., and with ISDN's rapid call setup, connect time was reduced to milliseconds.

Another dividend I received was an ISDN link to local-area network gateway service. For any user who becomes used to accessing corporate files via a 10M bit/sec. Ethernet or a 16M bit/sec. token-ring at the office, the 1,200 or 2,400 bit/sec. rate of a home modem becomes simply impossible to endure. The difference is so great that many users are discouraged from doing any serious production work at home.

Although ISDN's 64K bit/sec. B channel cannot approach Ethernet or token-ring speeds, it can add to productivity by making certain applications possible at home, such as large file transfers and real-time

Continued on page 51

One small step for networks

NASA ahead of other organizations to tap SNMP for net management

ON SITE

BY ELISABETH HORWITT
CW STAFF

CLEVELAND — While other organizations wait for vendors and the Open Systems Interconnect standard to deliver the network management system of their dreams, the National Aeronautics and Space Administration's Lewis Research Center is already laying the foundation for managing its heterogeneous networking installations.

The agency has yet to finalize its plans, but it has pretty much decided to base its network management system — at least for the next few years — on Simple Network Management Protocol (SNMP), according to Gary Stewart, a contractor at Sverdrup Technology, Inc. who is working on the project.

While SNMP provides limited functionality compared with the future Open Systems Interconnect (OSI) network management standard, it is "the closest thing to an industry standard now" and provides a lot of flexibility for collecting information from various networking devices, Stewart said.

Stewart *puts SNMP through NASA checks*

The center is also evaluating Sun Microsystems, Inc.'s Sunnet Manager, a management workstation that now supports SNMP and will later support other protocols, such as OSI , according to Sun. As a beta-test site for Sunnet Manager, NASA has found the system capable of collecting "a tremendous amount of information" from various networking devices and even hosts, Stewart said.

Right now, Sun's product is "still in its infancy" and has revealed certain limitations, Stewart reported. For example, Sunnet Manager has been able to collect network statistics from Cisco Systems, Inc. routers, which support SNMP, but not from Proteon, Inc. routers, which also support the protocol, Stewart said. He has yet to determine the reason.

The strength of Sunnet Manager and SNMP, however, is in their flexibility and potential for growth, according to Stewart.

Sun told NASA that at least 60 vendors have licensed the Sunnet Manager agent specification to embed in their products. The product will shortly be shipped with 11 programs that will primarily be supplied by third parties for interacting with popular systems such as IBM's Netview and Common Management Information Protocol over Transmission Control Protocol/Internet Protocol, according to Sun spokesman Dennis Raymond.

A spate of vendors has been jumping on the SNMP bandwagon, responding to users' evident disgust with OSI's continued slow progress toward commercial availability [CW, March 19].

Another limitation to Sunnet Manager, which might daunt some users with less technical and programming resources, is the system's lack of existing applications for analyzing and processing all the networking statistics the system collects. "Sun has limited graphics, strip and bar charts to bring up, which is fine if that's all you need," Stewart said.

However, NASA and Sverdrup have been satisfied with the tools Sun has provided, including a Microsoft Corp. Windows-based, "point-and-click" system for adding new network addresses, devices to be managed or forms for storing data, Stewart said. Users can load collected network statistics into whatever graphics and statistical packages they choose. "You don't need a heavy-duty programmer to do this — just someone strong in Unix," he added.

NASA programmers, for example, have used Sunnet Manag-

Continued on page 50

FTP allows OS/2 to 'speak' TCP/IP

BY JOANIE M. WEXLER
CW STAFF

Until recently, companies that have committed to OS/2 have had few options available for connecting systems using the Microsoft Corp. operating system to Unix-based systems and networks.

FTP Software, Inc. however, delivered TCP/IP software for OS/2 last week, that, according to beta-test site users, provides more communications functionality than other vendor's releases.

FTP's $575 implementation, PC/TCP, which was scheduled to ship last Monday, squeaked in ahead of competitor Novell, Inc.'s offering, slated for delivery last Friday.

The availability of the FTP product is a boon to beta-test user Graphics Software Systems, Inc. (GSS) in Beaverton, Ore., which is using TCP/IP to link its IBM-compatible personal computers, Digital Equipment Corp. VAXs and Sequent multiprocessing machines.

Tim Stevenson, who is director of product development at GSS and has evaluated 3Com Corp.'s TCP/IP package, reportedlly shipping since October, said PC/TCP provides "an enormous list of Unix networking tools" and that for interfacing an OS/2 workstation to Unix, "FTP's product would be preferable."

Before the company started beta testing PC/TCP, according to company spokesman Russ Sprunger, users took the "Sneakernet" approach of downloading data from a DOS machine, hand-carrying a floppy disk to the OS/2 workstation.

"All the machines in our building are linked by Ethernets," explained Sprunger, who added that GSS requires a mixed environment consisting of DOS, Unix and OS/2 operating systems because it develops graphics programming tools for those environments. Sprunger said the product is "working fine, with the usual couple of glitches" and that he is leaning toward purchasing FTP's offering.

Beta-test user Tim Peters, a project manager on the finance staff at Ford Motor Co., does not have as widespread a use for the software as Sprunger because he is currently networking OS/2 on an IBM Token-Ring and is primarily running Netbios and Systems Network Architecture protocols. Peters said that his interest in TCP/IP is to allow OS/2 to interact with engineering host machines from DEC, Cray Research, Inc. and Sun Microsystems, Inc.

Peters acknowledged, however, that if users "are used to TCP/IP on their DOS workstations and don't have it for OS/2, they have a problem."

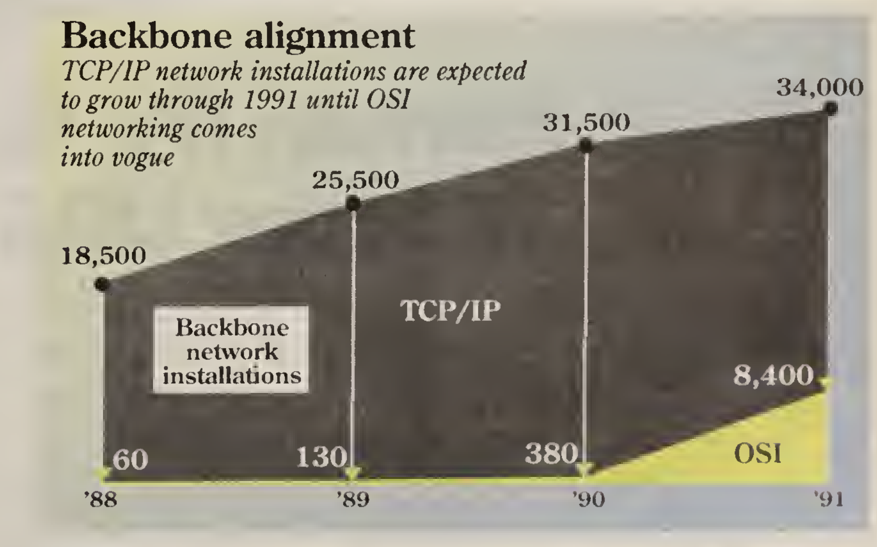
Peters is already running FTP's TCP/IP for DOS, which he said was the most "robust" of the available offerings.

He explained, for example, that FTP's "Ping" feature, also available on PC/TCP, allows a workstation to query a host to see if it is up and running and provides more capabilities than other implementations. Ping is an Internet protocol for determining whether systems are functioning on a basic level by sending out packets and getting acknowledgments.

"With less 'robust' software," Peters explained, "when you do certain functions, some features may be missing or you might get abbreviated information."

Microsoft, which announced in October 1988 that it would add software to provide OS/2 systems with the widely used Transmission Control Protocol/Internet Protocol (TCP/IP), said it is not yet committing to a shipment date.

It is said that IBM plans to ship its TCP/IP software for OS/2 next month, though the company was unable to confirm the product's status at press time.



Backbone alignment

TCP/IP network installations are expected to grow through 1991 until OSI networking comes into vogue

Source: International Data Corp.

CW Chart: John York

ICA study disputes telecom network criticisms

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The International Communications Association (ICA), a major group of business ratepayers, released a study last month intended to dispel the notion that the U.S. telecommunications infrastructure is becoming second-rate.

To the contrary, the public switched network in the U.S. "is simply in great shape today," said the report by the ICA's consulting firm, Economics and Technology, Inc., which is based in Boston.

In 1988, the U.S. telecommunications industry invested $300 per access line (including private network outlays), an amount far greater than that invested in other nations, according to the ICA study.

"Even in advanced nations such as Japan, France and West Germany, the public networks are still trying to catch up to the U.S. They have a long way to go," the study said.

Scare tactics

The regional Bell holding companies, in a recent advertising campaign, have been misleading the public and policymakers by suggesting that the U.S. is losing its lead in telecommunications, the ICA charged.

The Bell companies, ICA officials said, are using "scare tactics" in an effort to win freedom from the restrictions of the AT&T divestiture ruling [CW, March 19] and to get government support for a revenue-boosting network modernization program.

"The root of the telecommunications infrastructure debate is money," the ICA report said, noting that running fiber-optic cables to every subscriber — one of the modernization proposals — would transfer at least $230 billion from ratepayers to the telephone companies.

The ICA study stressed that network modernization should continue but at the same "realistic pace" as in the past three decades.

In response, the Bell holding companies maintained their view that the U.S. lead in telecommunications is slipping. "It's incredibly ironic that the country that invented the telephone is sputtering into the information age, because court-imposed restrictions have forced seven of America's most capable telecommunications companies to sit on the sidelines," a spokesman for US West, Inc. said.

The National Telecommunications and Information Administration is currently studying the infrastructure issue, including the relative level of U.S. network investment and the role of private networks [CW, Jan. 22].

The ICA study also disputed the notion that investment in the public networks is harmed when big businesses turn to private networks.

Most so-called private networks include elements of the public networks, according to the ICA, and technology advances in the public networks are beginning to erode the use of private networks.

"Private networks proliferated in the past either because public networks were inadequate to handle new data communications needs or because the network's function is so specialized that it doesn't make economic sense to deploy its functions generally throughout the public switched network," the ICA study explained.

The remaining dedicated private networks are required for specialized data communications and are used by countless consumers and small businesses for banking, credit, travel and point-of-sale services, the ICA said.

Datacomm Commentary

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UDS
MOTOROLA

NASA

CONTINUED FROM PAGE 49

er in combination with a package called Dataviews from Visual Integrator Corp. in Amherst, Mass., to create three-dimensional graphical presentations of the networking activity of just about any NASA networking device — even a Vitalink bridge that does not support SNMP, Stewart said.

NASA has also set up on Sunnet Manager a program using an Internet protocol called Ping that sends out packets to devices and hosts that do not support SNMP and determines if they are up and running.

Right now, Sunnet Manager and SNMP together provide NASA with a good beginning, but they are by no means the final answer to its multivendor network management needs, Stewart said.

"We're at the point of deciding which tools will be part of our long-term network management system, and we're not sure if Sunnet Manager will provide it all" in terms of information management, graphics presentation and a central network controller to coordinate everything, he added.

NASA will use Sunnet Manager in some capacity in an SNMP-based network management system that will manage the majority of its equipment, Stewart said. However, that system may take three or four years to mature, he added.

"A lot of people are trying home brew to manage the networks they have, and what they like about SNMP is that it's open and extremely flexible," Stewart said.

Compaq links EISA to token-ring nets

BY RICHARD PASTORE
CW STAFF

HOUSTON — In an effort to bolster the supply of networking peripherals designed to reap the full advantage of 32-bit Extended Industry Standard Architecture (EISA), Compaq Computer Corp. last week announced plans to ship its first 32-bit controller for token-ring networks.

In benchmark tests, the Dualspeed Token-Ring Controller yielded data transfer rates 32% faster than an IBM Token-Ring Network 16/4 Adapter/A controller, Compaq claimed.

The controller, which is intended for Compaq's Systempro and Deskpro 486/25 EISA machines, was co-developed with Proteon, Inc., according to a source briefed by Compaq.

Proteon sells the controller under its own name through value-added resellers, while the Compaq version will be sold through retail channels. It is priced at $1,299.

> THE PROTEON and Compaq controllers are the only 32-bit EISA token-ring devices available.

Compaq director of new product marketing, Lynn Schelmayer, said the Proteon and Compaq controllers are the only 32-bit EISA token-ring devices available.

Indeed, since EISA machines began shipping last year, industry observers have complained that there are not enough peripheral devices available designed to fully exploit the larger I/O path.

"Users have just not been getting a lot of choice," said Dan Ness, an analyst at Computer Intelligence in La Jolla, Calif.

Novell, Inc. is also shipping a 32-bit Ethernet card for EISA machines, a Compaq spokesman noted.

Compaq also announced a 240M-byte Drive Array Pair upgrade for the Systempro and Deskpro 486/25. The $3,999 upgrade will be available this week, the firm said.

Fritz

CONTINUED FROM PAGE 49

graphics. After all, no one wants to sit around waiting for a 1,200 bit/sec. link to repaint a graphics screen. Besides enhancing present applications, residential ISDN has brought two new applications to my home: virtual networking and remote personal computer access.

ISDN virtual networking is an exciting new technology that may have a considerable effect on residential users. With software written for ISDN such as Manylink by Sun Dance Software in Redmond, Wash., or Easystreet by Herndon, Va.-based Newbridge, links can be set up to any PC or Apple Macintosh for file transfers, directory browsing and common peripheral sharing. Gone forever is the frustration of having critical files inaccessible at the office or at home.

ISDN is also an especially good vehicle for screen sharing and remote control of any PC or Macintosh. Using software such as Carbon Copy Plus by Microcom in Norwood, Mass., or Timbuktu Remote by Berkeley, Calif.-based Farallon, it is now possible for me to back up the office hard drives in the leisure and comfort of home at any weird hour I choose.

For system analysts and mainframe programmers, residential ISDN offers the benefit of 64K bit/sec. 3270 synchronous connectivity. An IS director could assign ISDN residential lines to staff for maintenance and emergency purposes. I know more than one system analyst who would willingly trade those 3 a.m. emergency trips to the computer center for a trip across the hall.

Unfortunately, the arrival of ISDN in my home last March did not signal a change of heart for the operating companies. My ISDN service is simply an extension of the service already offered on campus. Acquiring residential ISDN is an uphill battle for any computer user because ISDN has been almost exclusively targeted at corporate customers. Because upgrading central office facilities to support ISDN is no small undertaking, the telephone operating companies are understandably anxious to recover their ISDN investment as quickly as possible.

However, if the first few weeks are any indication, it is clear that there are enough useful residential ISDN applications to merit a close look at the market by local carriers.

With all the benefits of residential ISDN service, I could go on working for hours. But it's 4 a.m., and my wife wants me to come to bed. I promised her that I would just as soon as I transferred my column to the office PC and printed it out on the office laser printer. I want our secretary to send it in first thing in the morning — I intend to sleep in.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

If you think a fault-tolerant network will be too expensive, think about what downtime costs.

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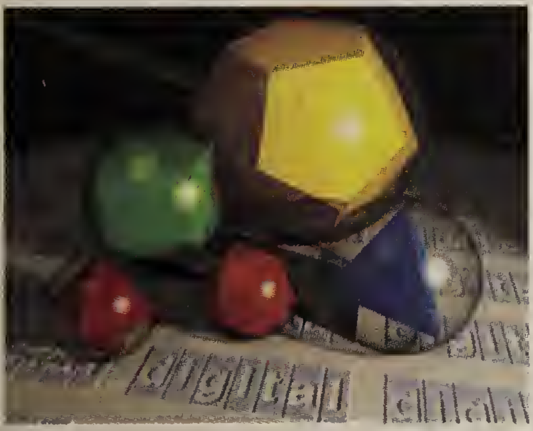
Everything about the DECstation 5000 Model 200 workstation says speed, power and leadership performance.

For starters, it's driven by the MIPS R3000 CPU chip which supports 8-120 MB of memory – that's more than you get on any other desktop workstation.



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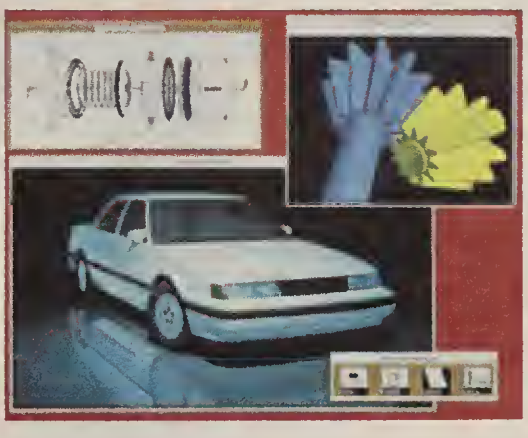

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NEW PRODUCTS

Network management

Racal-Milgo has introduced its Datacryptor Key Management Center for commercial network security applications.

The personal computer-based system provides centralized control of network and key management functions for a network of encryption devices. The system comprises a customized 386/20e PC, a standby power system, two printers and a Datacryptor 64KC device. Features include cryptographic alarm and error reporting, key status, operating mode control and configuration downloading.

Pricing begins at $15,490 plus a software license fee.

Racal-Milgo
1601 N. Harrison Pkwy.
Sunrise, Fla. 33323
305-846-1601

Cabletron Systems, Inc. has introduced a network analyzer for IBM Personal Computers used in Ethernet or 802.3 networks.

Lanview features continuous network monitoring as well as audible and visible alarm mechanisms that indicate network malfunctions. The price is $11,995.

The company also announced plans to offer its Remote Lanview Windows network management software with Sun Microsystems, Inc.'s Unix-based Sunnet Manager platforms. Cabletron's DOS-based Remote Lanview Windows software sells for $4,995. Sunnet Manager sells for $10,000.

Cabletron
P. O. Box 6257
35 Industrial Way
Rochester, N.H. 03867
603-332-9400

Gateways, bridges, routers

A remote bridge that provides a transparent link between Ethernet local-area networks has been announced by Network Application Technology, Inc.

LANB/200 links Ethernet LANs via high-speed synchronous connections, including 1.544M bit/sec. T1, fractional T1 and 2.048M bit/sec. European E1.

The product is available with a self-contained enclosure, RS-449/422 interface and power supply for $2,995. An optional thin Ethernet interface costs $150.

NAT
21040 Homestead Road
Cupertino, Calif. 95014
408-733-4530

Network Systems Corp. has announced routing and bridging support for Xerox Corp.'s Xerox Network Systems protocol, Novell, Inc.'s Internetwork Packet Exchange/Sequenced Packet Exchange and 3Com Corp.'s network protocol.

The company's VME-based internetworking local-area/wide-area network bridges and routers can provide routing of 8,000 packet/sec. and bridging of more than 14,000 packet/sec., the vendor said.

A unit with one Ethernet and one T1 link costs $8,900.

Network Systems
7600 Boone Ave. North
Minneapolis, Minn. 55428
612-424-4888

Electronic mail

Enable Software has announced a service that synchronizes the name list databases of various Higgins electronic mail systems across an enterprise.

Higgins Names Synchronization (HNS) is an upgrade to its Higgins Exchange, a wide-area mail manager that transfers mail between servers and local-area networks. HNS includes a remote procedure execution feature and comes equipped with Higgins Remote, a modem-based version of the product.

HNS was slated to be available last month as a utility with Higgins Exchange Version 1.2. Higgins Exchange sells for $695, and current users of Version 1.2 can upgrade their systems for free, the vendor said.

Enable
1150 Marina Village Pkwy.
Alameda, Calif. 94501
415-865-9805

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To get your free 2MB piggyback board, fill out five registration cards (one per each Above Board Plus 8/Plus 8 I/O package) and mail along with copies of your invoices, dated between March 1 and June 30, 1990, to: Intel Plus 8 Promotion, P.O. Box 14070, Portland, Oregon 97214-9949. For more information on this special offer, call 800-538-3373.

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Kenneth J. Soha, former director of executive support systems at Xerox Corp., has joined **Executive Insight Group**, a consulting firm in Bryn Mawr, Pa., as vice-president. He will lead the firm's executive information systems (EIS) consulting practice.

A 25-year Xerox veteran, Soha led the conceptualization and implementation of Xerox's EIS, which has been supporting executive users worldwide since 1984.

Before his most recent position at Xerox corporate headquarters in Stamford, Conn., Soha was vice-president and controller of the company's Business Products and Systems Group in Rochester, N.Y.

He was also one of four senior executives on Xerox's vendor selection committee for computer-aided design and computer-aided manufacturing products.

Soha holds a bachelor's degree in management from Boston College. He has been a sponsor representative to the Center for Information Systems Research at MIT, a guest lecturer at Babson College in Wellesley, Mass., and a faculty member of the EIS Institute.

……

Gary L. Senese has been named vice-president of management information systems at **Rubbermaid Commercial Products, Inc.** in Winchester, Va.

Senese was previously a manager at General Electric Information Services' Mark 3000 unit, located in Rockville, Md.

……

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any job changes in Executive Track. When you have news about any staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor-Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Lighting up IS in business

Years ago, Lithonia Lighting's Darnell decided, 'I'm no damn bookkeeper'

BY CAROL HILDEBRAND
CW STAFF

You could call Charles Darnell an old boy. He has been at Conyers, Ga.-based Lithonia Lighting for 26 years, and as chief information officer and a senior vice-president, he has earned his way into the company's top echelon.

But listen to him talk about making information systems critical to a business' success, and he sounds more like a man of the future — except that he came to these conclusions 25 years before strategic business systems and mission-critical applications became buzzwords.

Darnell, an energetic 52-year-old with a rich store of down-home anecdotes, is fascinated with the link between IS and business. When he talks about his career, it is clear that it has been a career in lighting fixtures, not IS. "I'm a lighting man first and a DP man second," he says.

Lithonia Lighting does not just pay lip service to these notions. Darnell is not only CIO, he has also been in charge of the company's strategic planning since 1976. Given that advantage, "It was very natural for me to take and integrate the company strategy with the information strategy," Darnell says.

The IS department bears the stamp of his personality, according to James McClung, president of Lithonia. "Charlie has enormous energy," he says. "He's a real initiator, an innovator."

PROFILE: Charles Darnell

Chuck Rogers

Position: *Senior vice-president and CIO, Lithonia Lighting*

Mission: *Improving company performance by creating information systems that effectively answer strategic business challenges*

Information Management Services Vice-President Jeffrey Kernan agrees. "Charles is fairly driven," he says. "He has strong ideas and a very strong influence."

Darnell consistently emphasizes that building a thorough understanding of the business is essential to crafting systems that are intertwined with its strategy. "If you're serving the DP god, than you can serve it just as well at one place as you can another. But if you're trying to get the most bang for the buck out of information technology, then you have to know something about the business," he says.

Continued on page 58

Richards' EFT programs rein in revenue

BY MITCH BETTS
CW STAFF

Texas politician Ann W. Richards, a rising star when she gave a rousing keynote speech at the 1988 Democratic National Convention, has not always had an easy time with computer technology. Shortly before the convention, she recalled, a computer glitch wiped out her speech draft, and it had to be reconstructed from notes.

Richards apparently has fared better in her job as Texas state treasurer, focusing primarily on the area of electronic funds transfer (EFT). The National Automated Clearing House Association (NACHA), based in Herndon, Va., recently named Richards the winner of its 1990 Payment Systems Excellence Award.

Prior to Richards' election as state treasurer in 1982, Texas had no EFT capabilities. One year after taking office, Richards introduced a rapid-deposit program that expedited the transfer of money to and from the state treasury to boost earnings on tax dollars.

Over the last five years, the state has created 49 rapid-deposit programs, each tailored to specific agency needs, and earned more than $1.2 billion in investment and other nontax income, according to NACHA reports.

In addition, Texas now uses EFT for nine major state programs, including electronic collection of taxes and state payments to school districts.

In January, Richards announced an EFT program called Texnet, designed to reduce the amount of time it takes large payments to come into the state treasury and begin earning interest. She estimated the state will earn an additional $5 million in nontax revenue as a result.

"In seven short years, she has developed and implemented model programs, which have saved the state's taxpayers millions [of dollars]," said NACHA President Elliott C. McEntee, adding that the Texas programs are being emulated by other states.

By the time she receives the award at NACHA's convention on April 30, Richards will have a better picture of her political future. She is currently running for governor of Texas and faces a run-off election tomorrow for the Democratic nomination.

Political analysts have called the whole primary campaign a Texas-style brawl, with the various candidates "attacking one another for alleged drug abuse, fraud, fistfighting, flip-flopping, dishonesty and inadequate devotion to the death penalty."

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Darnell

CONTINUED FROM PAGE 55

Darnell first came to Lithonia as a programmer in 1964. A national liaison for the former Sperry Corp.'s Univac computer division, he took a large pay cut in order to get back to his home state and settle down.

At the same time, Lithonia's president, Bob Freeman, was looking for someone he could mentor into the presidency. That search turned up McClung, then an MBA straight out of Harvard and a former classmate of Darnell's in high school as well as at Atlanta's Emory University.

It was Darnell and McClung, along with a team of five senior vice-presidents, who coalesced Lithonia's policy of driving the business strategy with IS answers.

"Early on," Darnell says, "I asked, 'What was the crux of the business? What made the business run?' At that time, it was taking orders quickly and getting those orders in. So we started work on order-entry systems back when they were unheard of."

There was some early resistance to that system. "People really thought that it was a financial system because of DP's financial connotation, and they wanted it to keep books," he said. "Well, I'm no damn bookkeeper."

> "MY FATHER USED to tell his salesmen that it was a mortal sin not to give everything you got, and he believed that. And I guess a lot of that got into me."
>
> CHARLES DARNELL
> LITHONIA LIGHTING

Darnell forged ahead with the order-entry system in spite of the resistance, and it was instrumental in pushing Lithonia to the forefront of lighting manufacturing. Darnell felt that it was important to establish what he calls C&C — confidence and competence. "If you've got the second, you'll get the first, and they'll let you do anything," he says. That was in 1968.

Building on the confidence established by the success of the order-entry and manufacturing systems, Darnell and McClung were able to develop Lightlink, an integrated group of networked systems that ties together the disparate elements of Lithonia's business [CW, Oct. 2, 1989]. Lightlink includes discrete modules for every part of Lithonia's value chain — warehouses, distributors and independent sales agents, also known as manufacturers' representatives. Because Lithonia has no captive sales force, the agents are at the hub of the entire chain of systems.

On the strength of Lightlink, Lithonia, located 20 miles east of Atlanta, has grown from an $18 million regional firm to a national giant with more than 5,000 employees and annual sales of $750 million. Lightlink also garnered McClung and Darnell a Partners in Leadership award from the Society for Information Management in 1988.

Darnell credits McClung with giving him the impetus to learn the lighting business from a programmer's chair. Instead of competing on the basis of issues such as price, McClung sought to differentiate Lithonia from its competitors by adding value — in this case, improved service.

With that in mind, "We wrote a policy statement early on that we would try to use information systems to create value," Darnell says. "So it became very necessary that I know what was going on in our business."

Darnell has not been content to rest on his Lightlink laurels, however. New ideas for the future are constantly bubbling on the front burner. He sketches in a three-pronged outline for the 1990s — to broaden Lithonia's product line, improve performance in the manufacturing arena and distribute products more efficiently. All are strong business objectives, and all are to be driven by IS answers.

Darnell's challenges generate strong enthusiasm in the IS department. "Charles is a very exciting person," says Kathy Smith, manager of systems training. "We know what we're doing day to day, but when you hear him talk about it, you say, 'Are we really doing that?' You realize that you're really ahead of everybody."

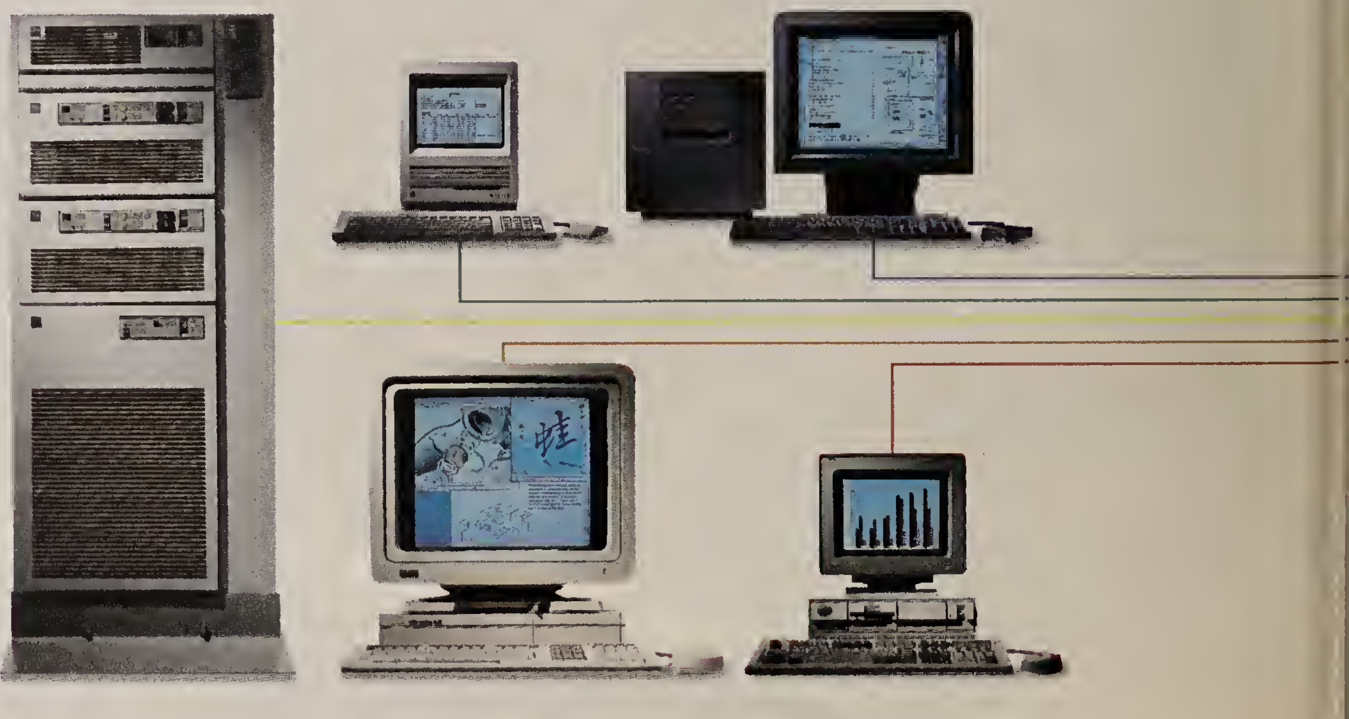
McClung agrees. "Charlie sets an example that motivates people to get involved and makes things exciting," he says. "It results in a lot of time and effort put in, but also in a lot of satisfaction."

Darnell says he plans to continue at Lithonia for three more years before turning things over to Kernan and starting his own international consulting business [CW, March 26]. In his spare time, Darnell said, he and his wife will continue to satisfy their addiction to travel.

Whatever he pursues, Darnell will bring the same dedication to hard work that spurred his father, a furniture salesman, to hold nightly meetings in the family living room. "My father used to tell his salesmen that it was a mortal sin not to give everything you got, and he believed that," he says. "And I guess a lot of that got into me."

Kernan, for one, finds it hard to imagine Darnell in even semi-retirement. "I don't think he'll be gone in three years," he says. "He continually needs new challenges. Whatever challenges he finds will be according to his own timetable."

JUST BECAUSE YOU HAVE A LOT OF DIFFERENT COMPUTERS,



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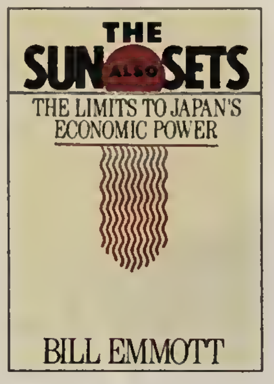
BOOK REVIEW

Nothing to fear: Shattering the image of Japanese threat

THE SUN ALSO SETS
By Bill Emmott
Random House, $19.95

Coincidentally, this book arrived at about the same time as a *Fortune* magazine issue that cried out "Fear and Loathing of Japan — Why it's growing, why it's dangerous, what to do about it." If this is a trend, then the U.S.' obsessive fear of Japan may thankfully be on the wane.



The Sun Also Sets should help that process along. In a brisk, information-packed style, it argues that Japan's economic wave has crested as the nation that built its economic might on thrift and industry has become, in the words of the book's chapter titles, "A Nation of Pleasure Seekers," "A Nation of Speculators" and "A Reluctant Leader."

The author, who spent three years as the Tokyo bureau chief for *The Economist*, methodically punches holes in nearly every stereotype of Japanese invincibility and does it with an exclamation point.

Will Japan be the economic superpower of the 21st century? Not likely, Emmott asserts. History has favored a multilateral balance of power, and dominance by a single nation has been a rare exception. More likely, Japan will share influence with the U.S. and Western Europe as the slowing economic scenario that Emmott describes throughout the book takes hold.

Much of Emmott's case involves knocking down the popular image of the Japanese as spartan and industrious. Quite the opposite is true, he argues; Japan's future is clouded by an emerging culture of consumerism and self-indulgence. Are the Japanese really great money-savers? The author points to a falling savings rate, huge growth in consumer credit and lavish spending on luxury goods as evidence that Japan's traditionally high savings rate is a passing phase. Do the Japanese really work harder? Not in the office, according to the author; what appears to be workaholism is more often long hours spent on inefficient processes or simple lust for overtime pay.

Emmott sketches a portrait of a society that's rapidly becoming drunk (sometimes literally) on its own wealth. Japanese consumers are traveling overseas more than ever and spending their strong yen at luxury hotels and designer stores, Emmott points out.

Furthermore, he argues that much of this newfound wealth is illusory. The rapid run-up in Japanese land values — real estate prices in Tokyo more than doubled between 1987 and 1989 — and giddy stock market highs have made millionaires out of speculators. Inflated stock holdings enable banks to lend money more freely, further fueling the speculation. All this, Emmott argues, *should* come crashing down.

Is Japan a closed market? The author cites the success of U.S. firms such as IBM and Procter & Gamble Co., which enjoy huge shares in Japanese markets, as evidence that Japanese consumers aren't afraid of buying U.S. goods. The trade deficit, he argues, is a fallout of big-ticket commercial sales, which tend to go to local suppliers.

A cornerstone of Emmott's argument is that Japan's population is aging faster than any other industrial power. Its percentage of elderly will overtake that of the U.S. by next year and lead the world by 2010. The graying of Japan, Emmott asserts, will sap the country's vaunted savings rate as the percentage of gross national product it spends on social costs will rise by 80% through 2025 — faster than that of any other industrialized country.

Ultimately, the argument comes down to leadership, and that is where Japan is weakest, the book asserts. Uncomfortable with foreigners, paranoid about remilitarization and afraid to disagree with its allies, Japan *wants* the U.S. to take the lead as a political force, Emmott argues. Consequently, Japan has a vested interest in keeping the U.S. economically strong, and its investment in U.S. industry should be seen as a vitamin supplement, not a bloodletting. Protectionism and trade sanctions are "a recipe for disaster," Emmott warns. A well-informed negotiating posture, not an aggressive one, is needed.

The Sun Also Sets is a must-read for anyone with a serious interest in the U.S. vs. Japan competitiveness issue. The book is packed with statistical evidence but liberally sprinkled with anecdotes and observations that Emmott compiled during his years in Japan.

If there is a significant weakness to *The Sun Also Sets*, it is in its reliance on extrapolation of current trends, often long into the future. However, most of the Japan-bashing literature that has hit the bookstores of late does the same thing, and to Emmott's credit, he acknowledges the limitations of speculation.

In the end, this book will make you feel good about the U.S.' competitive posture. After two years of persistent self-doubt, the change is welcome.

PAUL GILLIN

Gillin is *Computerworld's* executive editor.

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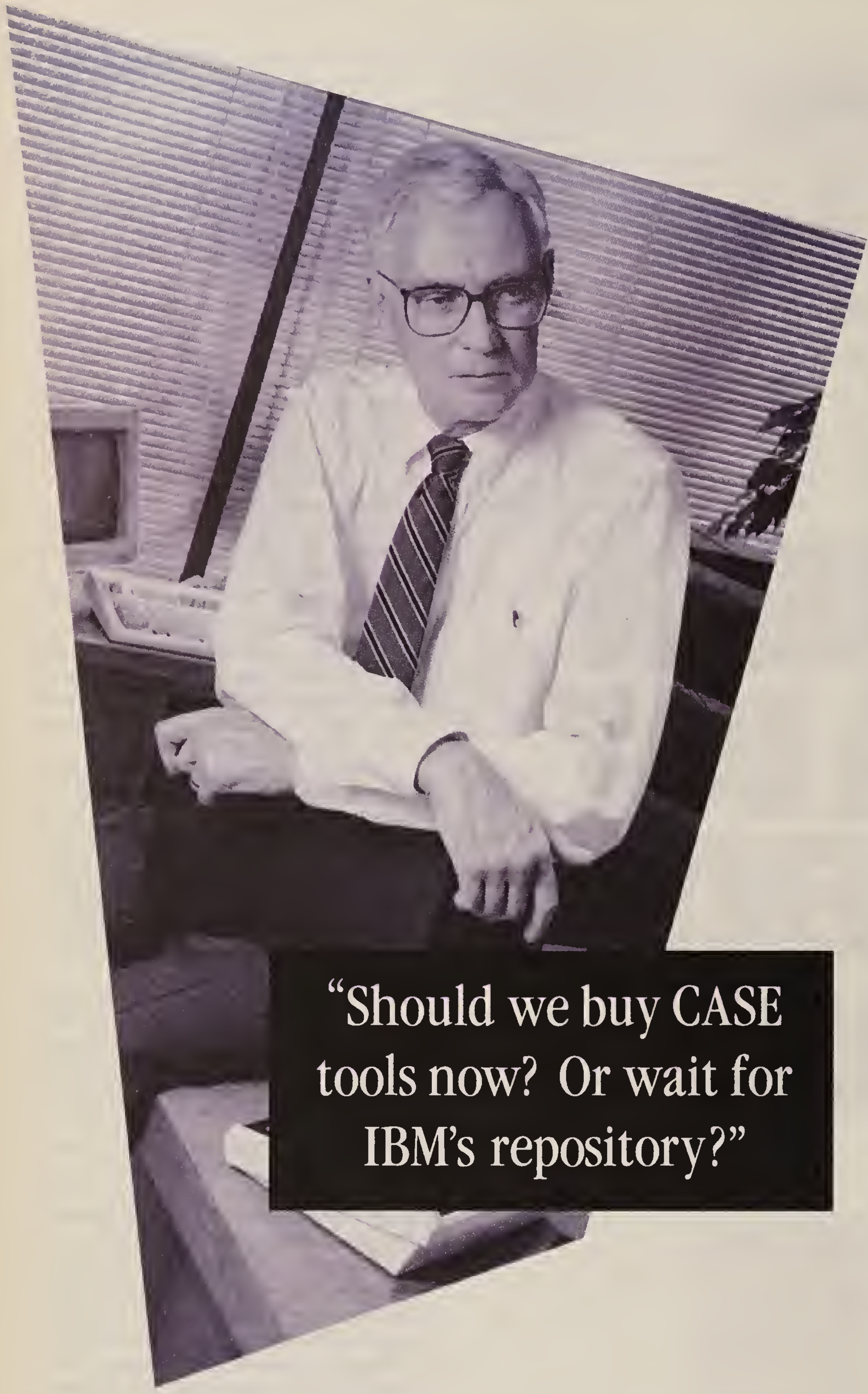

"Should we buy CASE tools now? Or wait for IBM's repository?"

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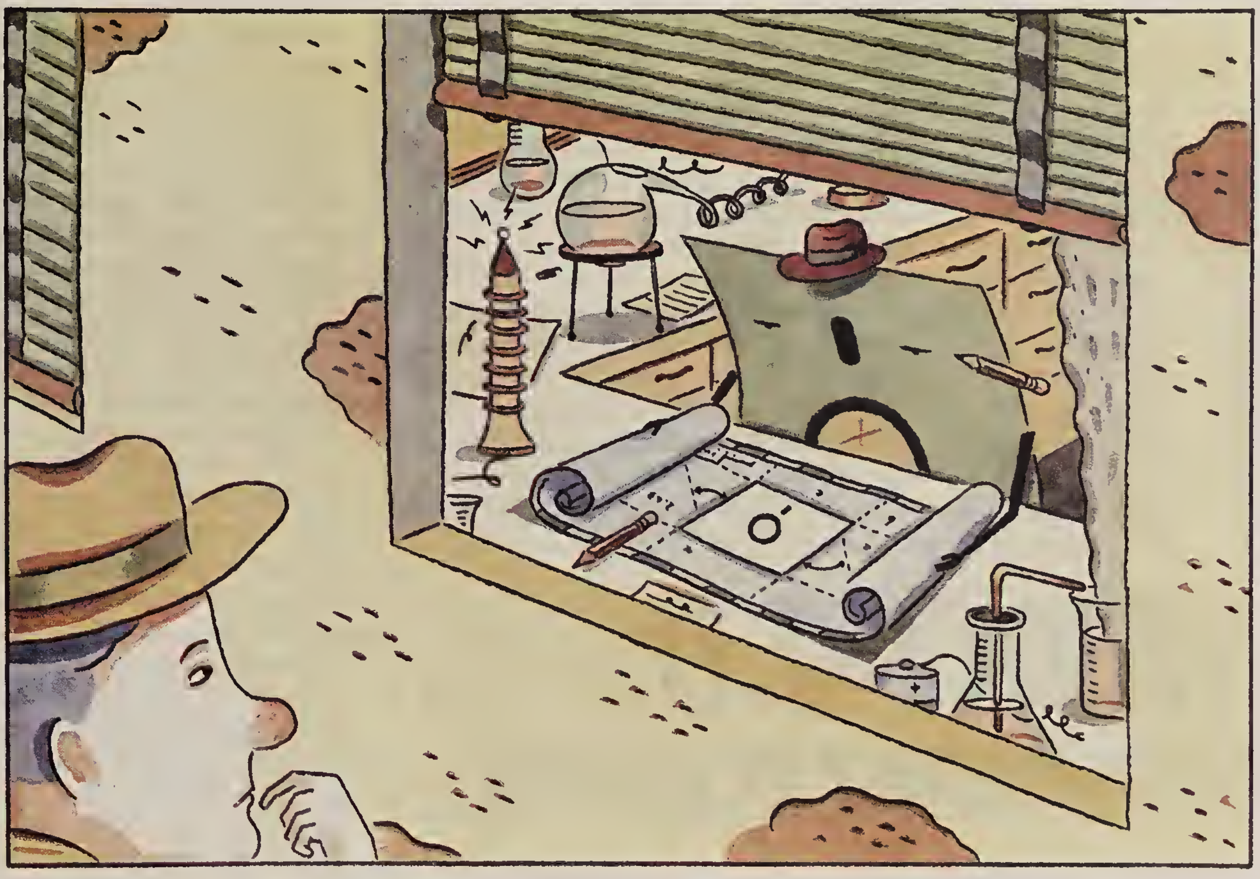
CASE

A peek at commercial developers uncovers some clues to the mystery

BY ANDREW TOPPER



Michael Klein

Anyone who hears a weather forecast can tell you when it's raining outside, but the person to ask about how to dress is the fellow who is already dripping wet.

Along the same lines, the only way to learn about CASE — besides implementing it — is to hear from someone who is using it.

One place to turn for practical insight is companies for which software development is the lifeblood — commercial software developers. While there are no hard numbers on the use of computer-aided software engineering (CASE) among these developers, many agree that there has been a surge of enthusiasm about the technology during the past couple of years. And those who are using it say it plays an important role in expediting what is an intensive job of applications development.

"Any tool that helps us cut down the time it takes to specify requirements and get them into products is helpful," says Bill Bagnell, strategic product manager at Integral Software, a supplier of payroll, personnel and financial systems in Walnut Creek, Calif.

"We face the same problems our clients do — only tenfold," says Steve Rabin, director of development technologies at American Software, a developer of vertical software packages for mainframes and minicomputers. "Since we develop for many different environments, when we encounter a software problem, we have to correct it in many different flavors. We are open to anything that can help us do that," he says.

CASE is also one answer to the large amount of code that needs to be produced. "You can force schools to produce more programmers or you can automate," says Al Macrae, director of the satellite communications and signal processing department at AT&T Bell Laboratories.

From the experiences of these early users, potential CASE purchasers can glean lessons that are applicable to their own organizations.

When Integral began its journey into CASE, it had three goals in mind: to upgrade one of its software offerings, migrate its internal software from IBM's DB2 Version 1 to Version 2 and develop a functional, rather than a technical, view of its applications' data structures to show clients.

To do this, Integral needed a tool that would automate its data modeling and database design phases and also reverse-engineer existing databases.

After considering the Chen Entity-Relationship Modeler and other data modeling products, Integral decided on Bachman Information Systems' Re-engineering Product Set.

A big reason for choosing Bachman was the tool's data-oriented approach to software development, which fit Integral's own. The Bachman tool "formalized a methodology we're using: a data-oriented environment with DB2," Bagnell says. "It would have been a mistake to impose something like [James] Martin's methodology on our systems development process."

INSIDE

Buyer's Scorecard Knowledgeware's front-end tools top user ratings. Page 68.

First Person A CASE implementor shares his experiences. Page 72.

Product Guide A summary of available reverse- and re-engineering tools. Page 78.

Choosing a tool that fits the existing development environment is crucial, according to Bagnell. "It would be a mistake to look at a CASE tool and adapt to its methodology," he says. "Don't throw away what's already there; augment what you've got."

Even if an organization does not have a methodology already in place, Bagnell says, it probably has identifiable areas of strength and weakness in the development process. These characteristics should be taken into consideration when a CASE tool is selected.

Bagnell recommends looking for the parts of your development process in which bottlenecks occur and finding tools that are strong in those areas.

"One place might say, 'We're

Topper is president of Foresite Systems, a Lansing, Mich., consulting firm.

Clues

FROM PAGE 61

too serial in our approach.' So they should find a tool that does design in parallel fashion, like JAD," Bagnell says.

A key is not to replace everything; you don't want to throw away things that are working.

In addition, Bagnell warns against rushing to adopt a single, structured technique for all software development needs. "We don't feel we can force our developers to use a certain tool or technique," he says. "We have to let them come around to it on their own time and be patient with them."

Bagnell says Integral's development staff made several false starts before becoming fully successful using the Bachman product. What is necessary, he says, is to define your goals before you start.

"You really need to know what you want to end up with," he says. "Ask yourself: What am I aiming for? What kind of model do I want — an exact replication of my data structure or a replication of what I want my data structure to be? What are people going to do with it once they have it? We ended up doing a lot of goal definition halfway through the project."

While Bachman takes care of the data-modeling side, Index Technology, Inc.'s Excelerator covers process modeling.

Integral purchased the product after seeing a high-level data model of one of its own applications developed by a client. It now uses the tool in the design phase of all new software development projects.

The problem of using two products, Bagnell says, is the lack of an interface between them. Although Bachman recently announced a link to Excelerator, Integral has been manually inputting the output from the Bachman tool into Excelerator, he says.

Because of the time involved in manual transfer of design data as well as the potential for error, Integral developers have had to settle for less detail. "We just input high-level stuff, like entities and relationships, not attributes. It cuts down on errors. It would be nice to do everything with one tool. But there's nothing available," Bagnell says.

In the long run, he hopes that IBM's repository will provide a transparent link between various types of tools. When it does eventually ship, "moving back and forth will be no trick."

Just as Bagnell was content to work around the missing link between Bachman and Excelerator, his philosophy on CASE is to move gradually. "The companies that fail are those that try to change too much too soon," he says.

On the other side, it's vital to have a CASE champion to rally the crowd. "You have to ask, 'Who can I talk into what?' " he says. "Go out, spread the word, and eventually, it sinks in. The problem is that people don't like to change, and the larger the company, the harder it is."

For the future, Integral, an IBM business partner, is looking to AD/Cycle for its CASE strategy. "AD/Cycle is the game you have to play," Bagnell says.

At AT&T, structured methods came first, and CASE made its arrival two years ago. Various pockets throughout the organization have been using the structured approach since the 1970s. When the manual effort of drawing diagrams and writing data definitions became prohibitive, Macrae says, several departments adopted a CASE approach to automation.

"The true benefits of CASE are actually benefits of using the structured techniques," Macrae says. "CASE takes the tedium out of structured techniques."

A strong advocate of a structured approach, Macrae sees the benefits of this approach to be stricter requirements definition, a reduction in software defects and improvements in staff productivity.

Probably the first thing an organization should do before launching a CASE initiative, Macrae says, is to educate software engineers in structured techniques. "We don't jump into tool training without first spending a lot of time doing methodology training," he says. "With our in-house education system, we can teach all the key people on a project, who then

Get the whole cost picture

BY HOWARD RUBIN

When determining a cost estimate for CASE implementation, looking at price tags is like looking through eyeglasses with only one lens. To get the full picture, you need to account for the cost of getting the system implemented and keeping it on the job.

Although this step is often overlooked, technology transfer, or getting the tools fully implemented and accepted, is no small trick. According to computer-aided software engineering expert Ed Yourdon, 70% of CASE tools are no longer used two years after acquisition, and for those still in use, only 10% of the intended audience is using them correctly.

It is also costly. According to most experts, you can expect to pay almost as much on a year-to-year basis to keep CASE usage on track as you spend on the initial hardware and software purchases.

Recently published figures from Yourdon and American Management Systems suggest, for example, that an organization with 200 professionals that spends $3.75 million on workstations, software and initial CASE investment can anticipate ongoing yearly costs of $540,000 for maintenance, support and training. After five years, that amounts to about $2.7 million. Other experts, such as Randall Jensen, chief scientist at Hughes Aircraft Co., place annual costs in an even higher bracket, postulating a $2 million expenditure per year for a 200-person department.

The first step is to determine your organization's readiness to assimilate CASE tools. To do this, you can rate your company's motivation level, willingness to make the investment, skill and education level, how organized it is for tool implementation, the type of technology platforms in existence and an understanding of its own culture and needed changes. Next, you can compare your ratings in these categories with ratings of the CASE tool's comparable attributes. If the CASE tool attributes exceed readiness, there is a low probability that your organization will use it.

Once you've determined the degree of readiness, you can calculate cost. The cost elements of technology transfer are as follows:

- **Education.** After familiarizing the staff with underlying software engineering concepts of CASE tools, the company must provide ongoing training and education. CASE technology is continually growing from a theoretical base of modeling techniques. If the staff does not keep up with this, it will lose pace with product evolution.
- **Skill development.** Beyond initial vendor training, the staff must become competent to use CASE concepts effectively in the work environment. The cost is in the learning curve.
- **Change management.** Programs need to be enacted to unfreeze the current culture and move the staff toward CASE acceptance.
- **Setting up and maintaining the support infrastructure.** Be it a single person, staff network or process group, a firm needs a staff that can support the CASE implementation. If there are already employees who know CASE, costs can be kept low.
- **Technology migration.** The organization must move toward the hardware and software configuration needed to support CASE and continue upgrading as necessary.
- **Selling, managing and monitoring the CASE initiative.** Management commitment is essential. The time required to sell CASE can amount to 10% of project costs for demonstrations, pilots and product selection meetings. These additional factors represent the cost of moving your firm from "here" (the current environment) to "there" (the world of CASE).

The actual cost of these additional factors depends on how far you have to go to create a conducive environment. Although it is impossible to specify a simple universal CASE cost computation, the following algorithm can help:

1) Compute your acquisition costs.
2) Assess your readiness.
3) Assess the attributes of the CASE environment that you want.
4) Compute the costs of bridging the gap between your firm's readiness and the eventual CASE environment.

Not only will this algorithm find you the true cost of CASE, but it is also a recipe for success.

Once you've discovered where the obstacles are, you can be better prepared to hurdle them. •

Rubin is a Nolan, Norton & Co. research fellow, professor of computer science at Hunter College and president of Howard Rubin Associates, Inc. in Pound Ridge, N.Y.

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share a common background in structured development."

The company is also putting together a booklet on CASE tools to educate other departments at AT&T besides software engineers. "Management has got to be informed and educated so that they buy into a new process. I'm happy to see that CASE is starting to have a big impact," Macrae says. While it plans on automating the entire life cycle, the division is now using only front-end CASE tools, some of which are commercial and some of which are built internally.

> "WE DON'T feel we can force our developers to use a certain tool or technique. We have to let them come around to it on their own time and be patient with them."
>
> BILL BAGNELL
> INTEGRAL SOFTWARE

When he first started out in CASE, Macrae says, he was idealistic about adhering to a single methodology. "All things being equal," he says, "my idea was to have one tool. I think it's a gleam in everyone's eye to have one integrated software development environment."

Although he says he would still wish for this integrated environment, Macrae now sees things more realistically. With the number of factors that go into tool selection — the hardware and software platforms, the type of software being developed, the experience of the people on the project — each development group is given a say in the tools it selects.

"The manager talks to a lot of people and makes recommendations for which tools would make sense for the project's needs," he says. "A common methodology is just not realistic."

Another advantage, he says, is that when people using the technique are involved in the decision, they are more willing to make the changes necessary to enter into a CASE environment.

There is still hope for the integrated environment, he says, because of the effort of many companies to integrate tools.

Macrae puts a lot of effort into tracking and measuring software quality. His department uses a standard modification request form to track the number and severity of defects in software developed and sold. The company then keeps statistics on these defects, including the cost of fixing them throughout the system's life.

The defect rates of software developed through structured techniques can then be compared with conventionally developed systems to measure improvements in quality. To measure productivity, the division uses the number of lines of noncommented code per man-year as a gauge. Noncommented code is the functional part of a program or system and does not include descriptions of the code.

Macrae has found its productivity improvement to be significant. "We've been pleased with the success on several projects," he says.

Another important thing to remember, Macrae emphasizes, is to use CASE only where it is applicable and not to enforce it across the board. For instance, the best place to start is on projects not yet begun. "To make changes midstream would be dumb," he says. "The last thing you want to do is change the architecture in the middle of making a house."

Using lower CASE

American Software took the back-door approach to CASE; that is, it began using lower CASE tools to offload applications development from the mainframe to the personal computer.

Using Micro Focus' Cobol/2 product — a Cobol compiler, debugger and editor — in conjunction with Excelerator, the company can take structure charts drawn in Excelerator and use them to generate skeletal Micro Focus Cobol code. It also allows pseudo-code defined in modules within Excelerator to be inserted into Micro Focus Cobol programs as comments.

The move from mainframes reduced overall development costs by 20%, according to Rabin. Response time was reduced from four seconds to less than one. In addition, the company was able to postpone an impending mainframe purchase.

The quality of software has also increased. Developing on PCs has resulted in a 30% to 40% decrease in the number of code errors, Rabin says. He attributes this to better testing facilities on the PC and more sophisticated programming capabilities with the Micro Focus product.

Rabin agrees with Bagnell that goal

Continued on next page

Pinning down the benefits

There is plenty said about computer-aided software engineering tools increasing staff productivity. But how do you track and measure the actual benefits?

Many companies use the number of lines of code produced per man-month as a basis. However, there are inherent problems with this measurement technique. In other words, more is not always better.

First of all, this metric is very dependent on the programming language used, be it third-generation, Cobol or assembler. A program written in Cobol that allows records to be added to a VSAM file, for example, will have significantly fewer lines of code than one written in assembler.

In addition, documentation may be written into the code, and you would not want to include that in the productivity metric. Also, this method often disregards the maintainability and performance of the finished code.

A better method might be to measure function points achieved per man-month. This measurement was developed by A. J. Albrecht at IBM, who defined a function point as a measurable, external aspect of a software system.

Albrecht listed the following five basic types of function points and then assigned a weight to each:

- Inputs to a program or system: 4 points.
- Outputs from a program or system: 5 points.
- User inquiries to a program or system: 4 points.
- File or database updates: 10 points.
- Interfaces to other programs or systems: 7 points.

Once you have added up all the function points of a program, you can start comparing function points per program in relation to how long it took to develop the program. You can also decipher how many function points are accomplished per week or month.

By applying these weights to specific programs under development, companies can track staff productivity as well as forecast how quickly they can develop programs.

In addition, by its very nature, this metric is independent of the language used and won't confuse documentation with actual code.

One company that has collected empirical data on the use of function points is Software Productivity Research Corp. in Cambridge, Mass. Based on national averages, the company defines a small system as having less than 100 function points; a medium system, 100 to 1,000; and a large system, more than 1,000 function points.

In addition, the average number of function points achieved per man-month for a small information system or commercial system is 12; medium is eight; large is four. The more complex the system, the fewer function points per man-month achieved.

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Continued from previous page

identification is an important first step to selecting a tool.

"We went into it idealistically. We were looking to get flow-charting and skeleton programs generation, which was no problem, but we should have looked for a tool with a more complete code generator and a closer integration with lower CASE tools," Rabin says.

Those functionalities were not available when the company was making its selection. This is another lesson, Rabin says: If the tool isn't here today, it may well be tomorrow. "We saw a dramatic improvement in tool capabilities over the last two years," he says. "As long as there is a strong market, this will continue."

Rabin is now considering a move to full life-cycle products. These, he says, may provide him with a more robust implementation of CASE than products such as Cobol/2 and Excelerator. Rabin says he learned a lot from the nonintegrated products, and it may be time to move to full life-cycle approach.

However, Rabin says, make sure the product fits your methodology. "Choose the methodology first," he says, "but don't turn everything upside down."

This echoes a further caution. "I would pilot-test a fairly critical project and establish time and cost estimates prior to bringing in a CASE tool," Rabin says.

The project's scope should be small enough to complete in a matter of two to three months. It should not require a large staff, and the staff members themselves should be positive about using CASE. The project should not be entirely new to the company so that results can be compared with previous methods.

For its project, American Software used Computer Associates International, Inc.'s Estimax to find quantitative results.

"I THINK IT'S a gleam in everyone's eye to have one integrated software development environment."

AL MACRAE
AT&T BELL LABS

The tool estimated the time it took to develop software on the mainframe and then measured the performance of Micro Focus Cobol/2 on the PC. Its measurement standard was the number of clean lines of code produced per day.

By doing so, the company was able to show management that CASE was indeed decreasing development costs and enhancing staff productivity.

To help people adjust to using CASE tools, American Software makes sure they are embedded in the life cycle and that the development environment matches the tool methodology. The staff is taught where the tools fit and what benefits are to be had.

Between commercial software developers and their clients, there are undoubtedly many differences in development environments — in scope and intent. But the concerns remain the same: to decrease cost and development time and increase efficiency and quality.

For these software developers, at least, CASE has lent a hand in these concerns. "CASE will be very significant in the future of applications software," Bagnell says. "We're certainly going to use it as a differentiator." •

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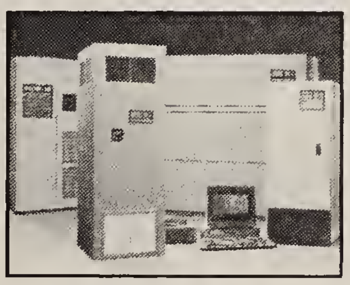

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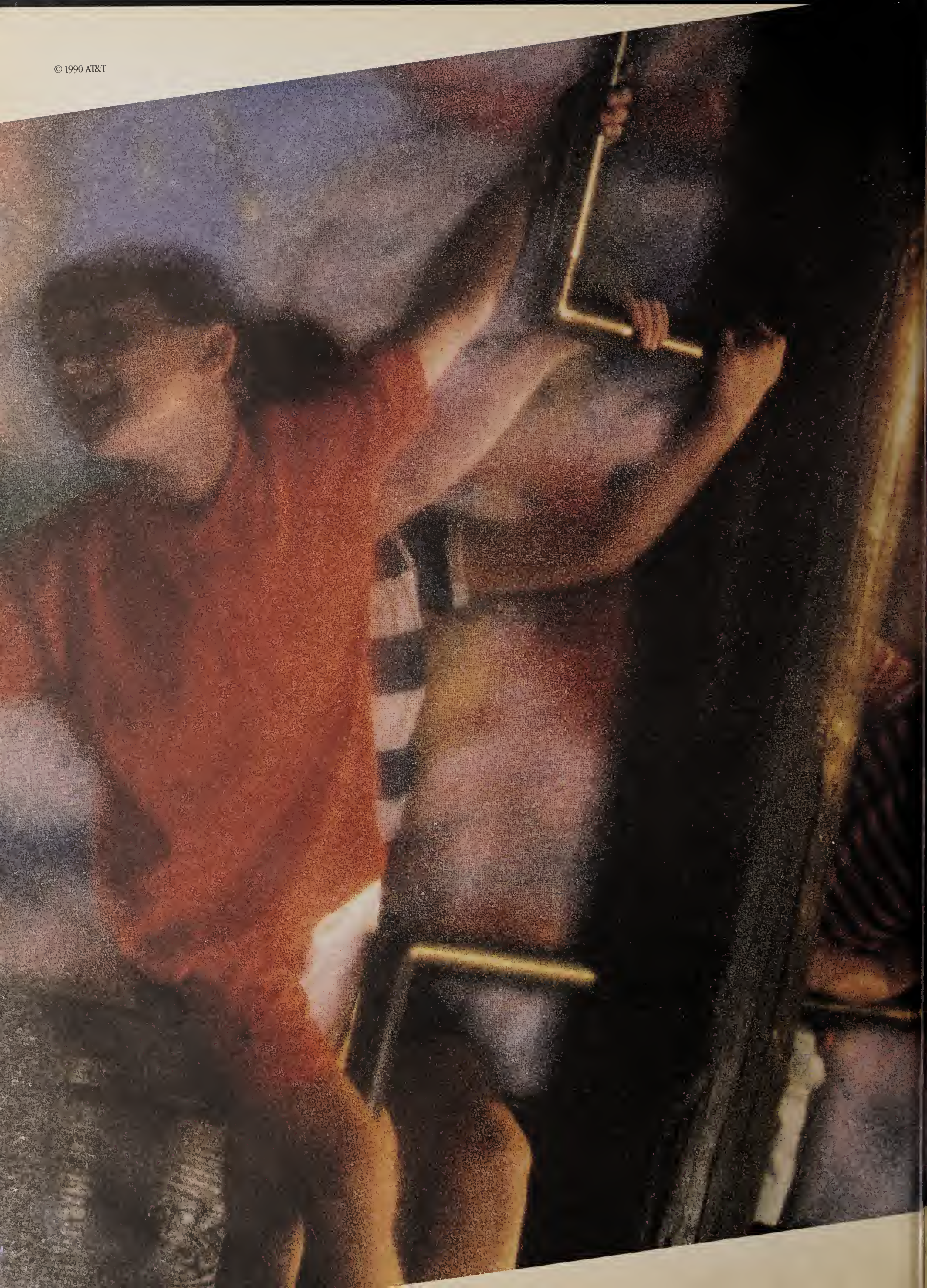

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BUYERS' SCORECARD

Knowledgeware bests front-end rivals

BY MICHAEL L.
SULLIVAN-TRAINOR

What do you get when you team up a methodology guru and a former pro football quarterback? The top-rated front-end package for computer-aided software engineering, of course.

When users of the four most prevalent front-end tools were asked to rate their products, the IEW/Design and IEW/Analysis combination — produced by Knowledgeware, Inc., an Atlanta-based company run by James Martin and Fran Tarkenton — earned the highest ratings across 16 criteria for CASE planning, analysis and design tools. Total scores were based on a weighted combination of the tallies for all criteria (see methodology next page).

Transform Logic's Design Aid came in a distant second, with Arthur Andersen & Co.'s Design 1 and Index Technology Corp.'s Excelerator in a third-place tie not far behind.

Despite a strong lead in installed base, with more than 16,000 copies already shipped, Excelerator edged ahead of the pack only once. Users rated it strongest in improving planning, analysis and design productivity.

Although CASE projects are often viewed in terms of productivity improvements, users don't see that as the primary benefit of front-end tools. The majority of respondents identified better systems quality and communication with end users as the major benefits (see chart next page).

Three of IEW's top ratings came in the areas users consider most important — moving from design to development, providing a full range of functions and integrating functions.

"We chose IEW because it implements the James Martin methodology, it's more structured, and it provides life-cycle support," says Rachel Kibbe, a consultant at the Technology Services Group of Dun & Bradstreet Services in Tampa, Fla.

Knowledgeware and Arthur Andersen offer integrated approaches that feature defined methodologies and close ties with their own back-end CASE tools. Index and Transform Logic provide methodology-neutral packages that link with back-end tools from a variety of other vendors.

According to conventional wisdom, the CASE market is still relatively immature. But 63% of the Buyers' Scorecard respondents reported that they have been involved with CASE usage for more than two years. In addition, 70% of the Design Aid users reported more than two years' involvement with CASE. Originally developed by Nastec Corp., the 6-year-old product was one of the first on the market. •

Sullivan-Trainor is a *Computerworld* senior editor, features.

BUYERS' SCORECARD

Summary of highest and lowest ratings show the most and least effective aspects of each product.

• Red dot indicates the most important criteria to users surveyed

Company Product Score	Strengths Based on first-place rankings	Weaknesses Based on last-place rankings
Knowledgeware **IEW Analysis and Design** **48.5** (Response base: 51)	● Moving from design to development ● Range of functions ● Integration of functions Mapping between stages Ease of use Information analysis Integrating with back-end tools	Supporting multiple developers Training materials Speed Project management
Transform Logic **Design Aid** **46.3** (Response base: 53)	Allowing enforcement of rules Training materials Speed Adaptability to methodologies Customization	● Moving from design to development ● Integrating functions Improving productivity Prototyping Integrating with back-end tools
Arthur Andersen **Design 1** **45.6** (Response base: 37)	Supporting multiple developers Prototyping Project management	● Range of functions Ease of use Information analysis Adaptability to methodologies
Index Technology **Excelerator** **45.6** (Response base: 53)	Improving productivity ● Integration of functions (2nd place) Ease of use (2nd place)	Allowing enforcement of rules ● Moving from design to development (3rd place) ● Range of functions (3rd place)

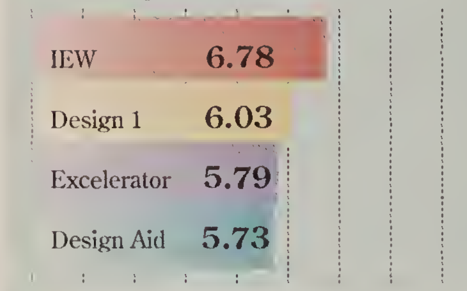
Key ratings

IEW sweeps five out of eight key ratings, including the three areas respondents consider most important: range of functions, integration and moving from design to development. Excelerator rates highest in productivity improvement, and Design 1 tops the list in supporting multiple developers.

Criteria presented in order of importance to all users (based on a one-to-ten scale)

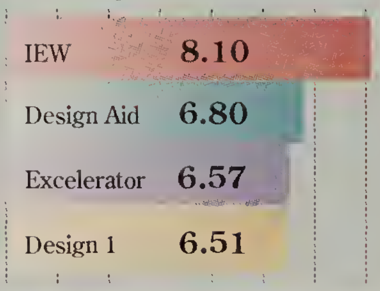
1 Ability to move from design to development

Criteria importance rating: 8.16



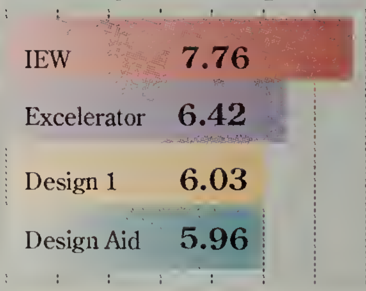
2 Range of functions

Criteria importance rating: 8.13



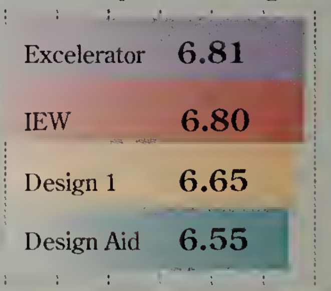
3 Integration of functions

Criteria importance rating: 8.09



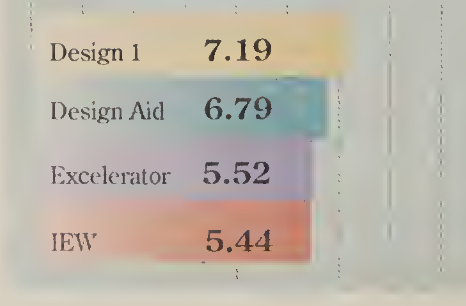
4 Improving productivity

Criteria importance rating: 8.01



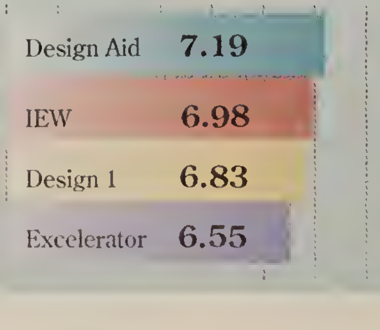
5 Supporting multiple developers

Criteria importance rating: 7.88



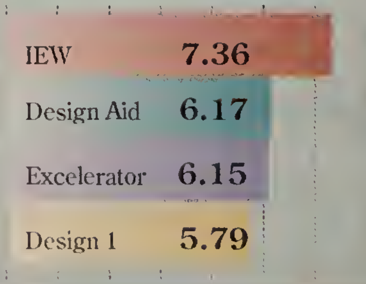
6 Allowing enforcement of rules

Criteria importance rating: 7.79



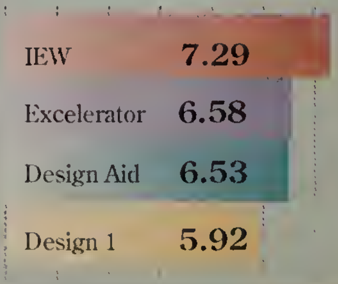
7 Mapping between stages

Criteria importance rating: 7.77



8 Ease of use

Criteria importance rating: 7.70

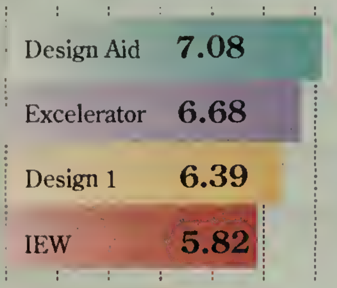


A closer look

Design Aid's speed and adaptability caused it to edge out the competition in four of the eight remaining satisfaction ratings. Design 1 rates substantially higher in prototyping and project management, while IEW tops integration and analysis categories.

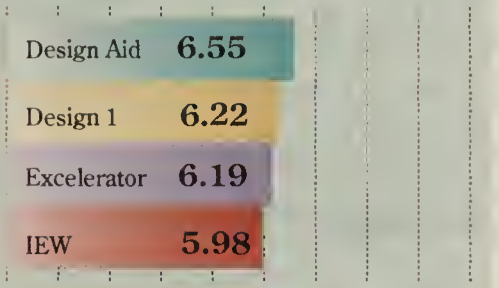
9 Training materials

Criteria importance rating: 7.58



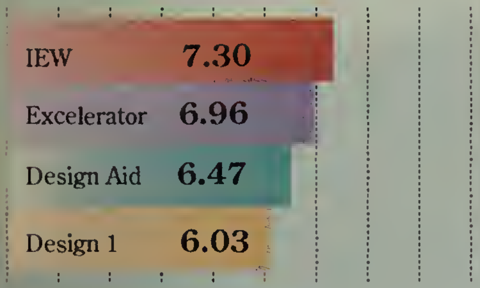
10 Speed

Criteria importance rating: 7.48



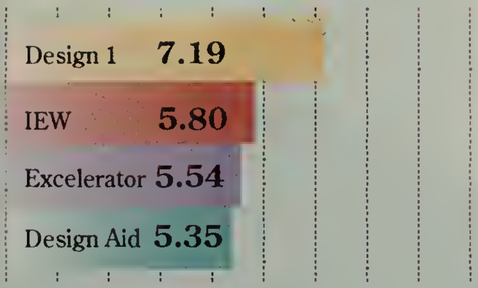
11 Information analysis

Criteria importance rating: 7.44



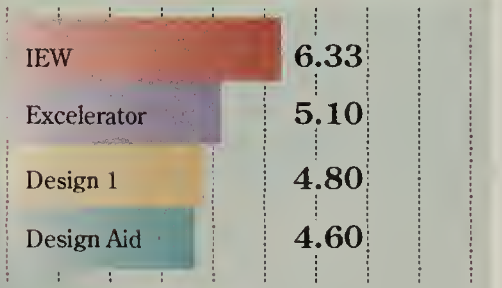
12 Prototyping

Criteria importance rating: 7.24



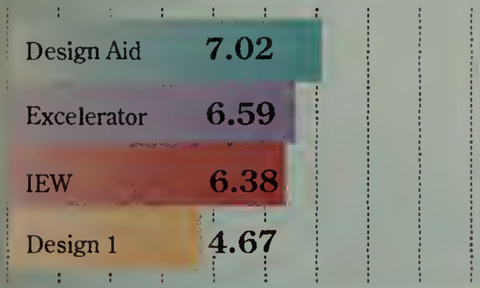
13 Integrating with back-end tools

Criteria importance rating: 7.13



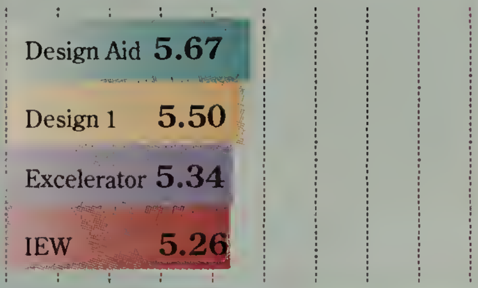
14 Adapting to different methodologies

Criteria importance rating: 6.63



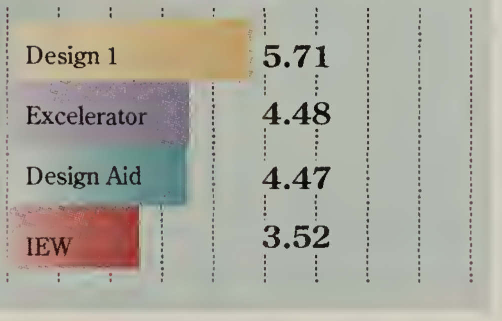
15 Ease of customization

Criteria importance rating: 6.33



16 Project management

Criteria importance rating: 5.81



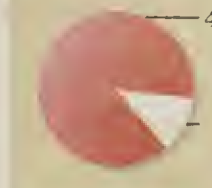
Loyalties

Would you buy the product again?

(Reasons based on most frequently stated responses)

IEW

Number of respondents

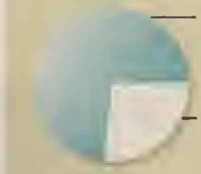


45 **Likely**
Why: Useful product, meets our needs

6 **Not likely**
Why: Other products are superior

Response base: 51

Excelerator

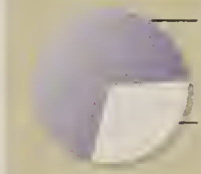


39 **Likely**
Why: Useful product, meets our needs

14 **Not likely**
Why: Poor integration with back-end products

Response base: 53

Design 1

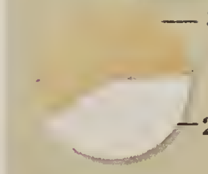


26 **Likely**
Why: Familiarity, meets our needs

11 **Not likely**
Why: Better products are available

Response base: 37

Design Aid



31 **Likely**
Why: Good design features, flexibility

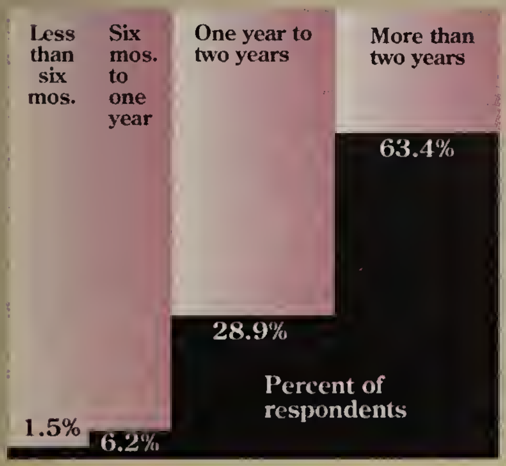
22 **Not likely**
Why: Does not interface well with other CASE tools

Response base: 53

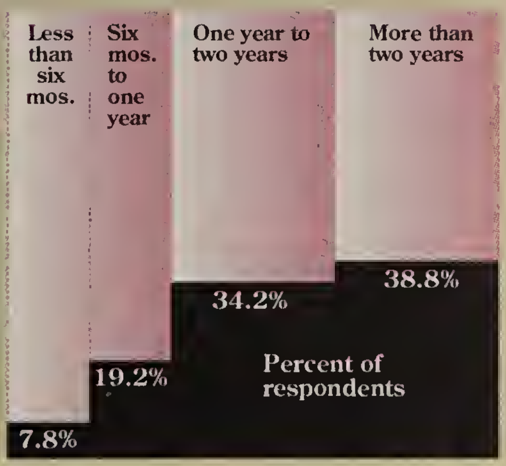
Vital statistics

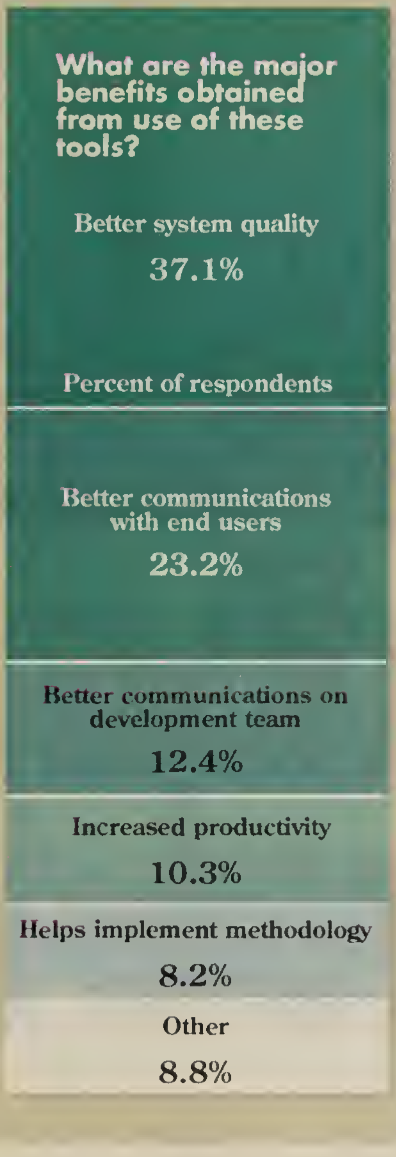
Response base: 194

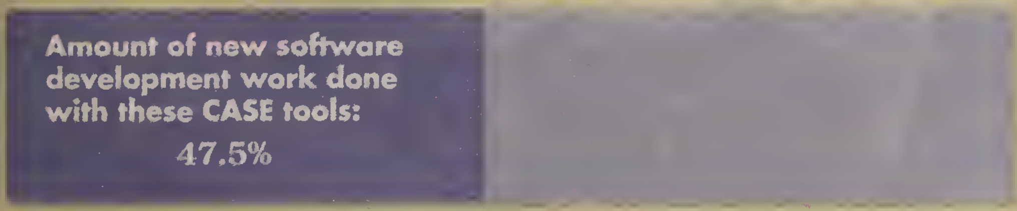
How many years have you been involved with CASE?



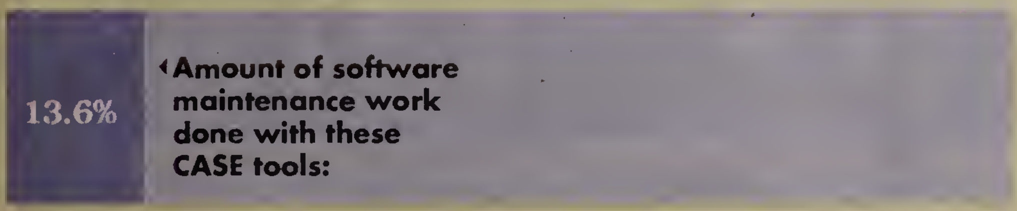
How long have you been using this product?







Respondents indicate that nearly half of all new applications involve CASE. They also report using these tools for a small but significant amount of maintenance projects.



METHODOLOGY

Products rated in *Computerworld's* CASE Buyers' Scorecard were chosen based on two criteria: They had to be planning, analysis and design packages that are sold as self-contained and independent products; and they had to be the market leaders in installed base.

The ratings were based on telephone surveys conducted by First Market Research in Austin, Texas. For the most part, lists of product users were provided by objective nonvendor sources. Because of the scarcity of sites where CASE products are in use, however, the response base does include names obtained from Transform Logic. Less than half of the responses in the Design Aid results are from this list.

The CASE comparisons involved phone survey results for a minimum of 50 respondents for each product, with the exception of Design 1, for which the minimum was dropped to 30 because of the small number of users available. The weighted scores were computed by multiplying the mean scores all users assigned to each criterion by the mean scores each user group gave to its own products.

Result tabulation was performed by IDG Research Services in Framingham, Mass. Survey development and results analysis were performed by CW in cooperation with consultants and users in the CASE field.

ACKNOWLEDGMENT

CW acknowledges the assistance provided by the following individuals and organizations in the preparation of this month's Buyers' Scorecard: Paul Bloom of Volpe, Covington & Welty; Bill Martorelli of New Science Associates; Dimitri Neos of Performance Resources, Inc.; David Sharon of CASE Associates; CASE Research Corp.; Computer Intelligence Corp.; Focus Research; and Digital Consulting, Inc.

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Once you're in, the water is fine

BY RICHARD A. KALISCH

About two years ago, my firm, American Electric Power Service Corp., decided to take the leap and invest in computer-aided software engineering.

The decision was one born of necessity. The company, a $5 billion electric utility holding company in Columbus, Ohio, was operating with a number of core business systems that were 15 to 20 years old. Requirements for updating these systems were piling up faster than we could handle with traditional development tools.

On top of this, new systems were constantly being proposed, including strategically important ones, such as one that would support nuclear plant maintenance. The issue was not just how to create more systems in a shorter time frame but also how to develop them in a way that would ease the burden of future support.

Our department supports eight operating companies and a large coal-mining operation via two data centers. We provide centralized services for the development, support and operation of standard corporate information systems.

The decision to use CASE tools was partly based on the weaknesses we had experienced with other approaches.

With each programmer taking a different approach to each project, third-generation languages such as CICS and Cobol left us with inconsistent results. There was no assurance that the resulting product would perform acceptably or be maintainable.

Fourth-generation languages seemed to offer only a quicker way to develop poor and unmaintainable code. Not only did they impose limitations on screen design and processing, but they also performed poorly in large transaction systems. Idiosyncracies in the languages generated unexpected results and performance problems.

In addition, although the broad array of traditional development tools is somewhat of a blessing, it is also a curse. These tools generally offer no common interface, overlap functionally and are based on different technical platforms.

When we embarked on our selection, we had a pretty good idea of what we wanted in a CASE tool. To us, integration was more important than individual tool richness. So rather than select individual CASE products and a methodology and then attempt to integrate these tools, we chose a comprehensive, integrated product that addresses the full life cycle and supports a specific methodology.

FIRST PERSON

A second requirement was the ability to generate third-generation CICS and Cobol II code from design specifications.

A significant consideration was that we were making a commitment to a vendor's product in a formative stage of the technology. It was important, then, to align with someone who would not get lost in the inevitable market shakeout.

Lastly, being an IBM shop, we wanted to be compatible with Systems Application Architecture products. In particular, we needed to buy into a CICS, Cobol II, DB2 technical environment.

We eventually selected Andersen Consulting's CASE offering, Foundation. This integrated product includes a comprehensive life-cycle methodology (Method/1), a PC LAN-based design component (Design 1) and a construction component (Install/1). We were pleasantly surprised by the positive reaction of our development staff to the change.

Throughout the pilot project, the 15-member project team was very positive about the product and the results. Today, they are happy to be less dependent on specialized technical expertise from systems programmers and database analysts.

I believe it was a combination of using a pilot project and seeing strong management commitment to CASE that influenced the programmers' initial positive reaction to the new environment.

The pilot project gave the staff a chance to understand new technology and become comfortable gradually rather than being thrust into it.

When choosing a pilot, it is important to find a project that is not mission-critical and that is limited enough to get your arms around. Then you can staff up for it and train appropriately.

Today, we currently use Method/1 and Design 1 on all systems development projects, including packaged and custom systems.

Install/1 is a code-generation tool set for developing CICS/Cobol II and DB2

Continued on next page

Kalisch is director of systems development at American Electric Power Service Corp. in Columbus, Ohio.

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Continued from previous page

programs. Based on a DB2 repository, it contains design specifications from Design 1, which generate the CICS screen maps and CICS coding.

We are using the mainframe construction of Install/1 on a pilot project, our first DB2 transaction system. Called The Meter Management System, it maintains facility information for all electric meters and auxiliary metering devices and supports metering operations and regulatory testing requirements for approximately four million devices.

The system consists of approximately 2,000 function points, 67 on-line screens, 70 reports and 185 batch modules. Under client acceptance testing now, it will be converted in our eight operating companies over the next few months.

As we moved through this pilot project, we began to see a more significant role for Install/1 than originally envisioned. Since the tool allows the programmer to develop standard business functions or technical features that can be reused in other systems, we were able to build a library of reusable code objects and common system features that are applicable across applications.

For example, as an extension of Install/1 security, we developed security by organizational levels. Each registered user is assigned a profile that defines his company, division, area or storeroom. This information is used for access security, populated on the on-line screens and reported in audit trail controls.

We are considering Bachman's tool set to cover functions not available on Design 1. We look forward to IBM's repository under AD/Cycle to provide good communication between Bachman and Foundation.

Through the use of CASE tools, we have seen a 50% reduction in coding and unit testing and an overall 25% reduction in installation effort. During integration and acceptance testing, we had sufficient experience with system changes and fixes to feel comfortable with at least a 50% reduction in the production support effort.

While productivity improvements during the design phase using Design 1 have been more difficult to quantify, we have observed a definite increase in design consistency, completeness and quality. •

ASK THE VENDOR

How will the Multitrak MIS Project Control System be integrated with CASE tools and IBM's AD/Cycle?

Dick Goluch
MIS Development Ctr. Manager
Miller Brewing
Milwaukee, Wis.

MULTITRAK SOFTWARE DEVELOPMENT CORP.: When IBM announces Project Control for AD/Cycle, Multitrak Software will build interfaces to directly link the AD/Cycle repository with the Multitrak Project database. These links will enable IS to monitor and track resources across the entire development life cycle.

We use ATI's Supercase to develop real-time systems. Unfortunately, some of our code was written before CASE tools became widely available.

Occasionally, we find it necessary to integrate some of this pre-CASE code into our current designs. Can Supercase help us bring this unstructured code into its structured environment?

Debbie Donohoe
Senior Electrics Engineer
General Dynamics
Valley Systems Division
Ontario, Calif.

ATI, INC.: The source-code input (SCI) option on Supercase can be used to maintain pre-CASE code, redesign old code and document existing systems. With Supercase SCI, captured code is available as a baseline for re-engineering an existing system.

During reverse-engineering, Supercase SCI issues reports that suggest specific design improvements. It can, for example, apply Ada concepts to existing Fortran code. In addition, designers can add missing design details, resolve ambiguities and verify interfaces between old and new code.

We are using the Bachman Re-Engineering Product Set. Is Bachman planning to support OS/2 with new versions of its product set in the future?

Bob Fiore
Manager of Database Design
Shearson Lehman Hutton, Inc.
New York, N.Y.

BACHMAN INFORMATION SYSTEMS, INC.: Bachman will provide support for OS/2 Extended Edition with products planned for fourth-quarter 1990. This OS/2 upgrade will be available to existing customers through their maintenence contracts at no additional charge.

Bachman also plans to announce the availability date for its OS/2J (Japanese version) products. Bachman will leverage many Extended Edition capabilities in its OS/2 Extended products, including Presentation Manager and Data Manager.

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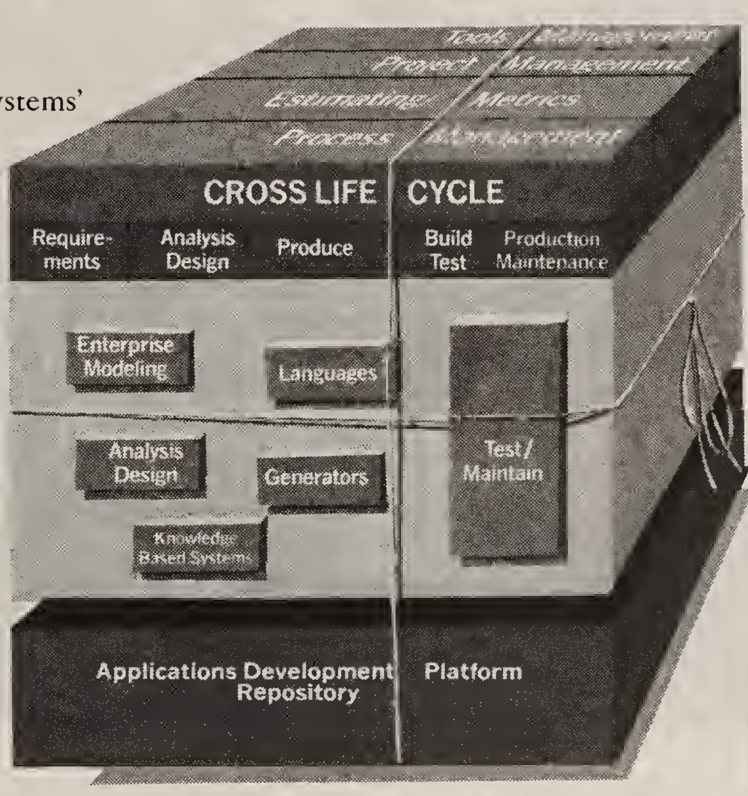

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The Newsweekly of Information Systems Management

The ensemble approach vs. a mix and match one

BY SCOTT WALLACE

There are two ways to order computer-aided software engineering tools: as a full-course entree or a la carte. The decision you make goes beyond how much you want on your plate; other factors to consider include how your company is set up, where you are heading with CASE and how much you can commit in terms of time, money and expertise.

When you buy a full-course, or full life-cycle, tool, you get a package that covers every stage of the software development life cycle — from analysis and design through coding, testing and maintenance — in one integrated product, including a methodology.

Since none of these stages actually stands alone, the tool also addresses the interaction among these categories.

The products generally considered full life cycle are Arthur Andersen & Co.'s Foundation, Texas Instruments, Inc.'s (TI) Information Workbench, Knowledgeware, Inc.'s IEW and CGI Systems' Pacbase.

> WITH A full life-cycle approach, there's less chance of details falling through cracks.

The a la carte, or nonintegrated, tool approach focuses specifically on one stage of the life cycle. The prime strength of these tools can be summed up in three words: "best in class." While you can get support for configuration management, version control and data and network security in full life-cycle products, nonintegrated tools focus on only one task. Hence, you can choose the best analysis tool for your needs, the best design tool, the best code generator and so on.

What you lose in this approach, however, is integration among tools. Since the stages in the life cycle overlap, it is essential for the tools to work together to minimize training costs, labor and code errors.

Full life-cycle products profess to offer such seamless integration. "When you go from one vendor's analysis and design tool to another's code generation, unless the interface is perfect, you lose detail," says Mickey Williamson, editor of newsletter "CASE Strategies."

But while you may have to work to get nonintegrated tools working together properly, "most of the point vendors are trying to integrate with other tools that attack other points in the life cycle," Williamson continues. In fact, she predicts, if you buy a nonintegrated tool now that covers only one stage of the life cycle, "by the time you're ready to move on, an interface will be there for you."

In addition, some full life-cycle packages actually started out as nonintegrated tools and got fused together. An example is TI's product.

Much of the decision depends on what the organization is ready for. While the enterprisewide embrace offered by full life-cycle tools may appeal to some companies, others may not be ready for the cultural change it demands.

"A lot of organizations are not ready for CASE tools," says Ed Yourdon, editor of "American Programmer" in New York. "For them, it's advisable to start small using point tools, select a methodology and experiment."

When you are ready to apply CASE to other stages of the life cycle, Yourdon says, you may need to go beyond nonintegrated tools if acceptable interfaces are unavailable.

Another question is whether your computing architecture is centralized or decentralized. If your organization takes many different product development approaches, nonintegrated tools address each segment of the life cycle without enforcing a single methodology.

The size of the project is another factor. As things get more complex, coordinating and synchronizing work in the different stages of the life cycle is more challenging. With a full life-cycle approach, there's less chance of details falling through cracks.

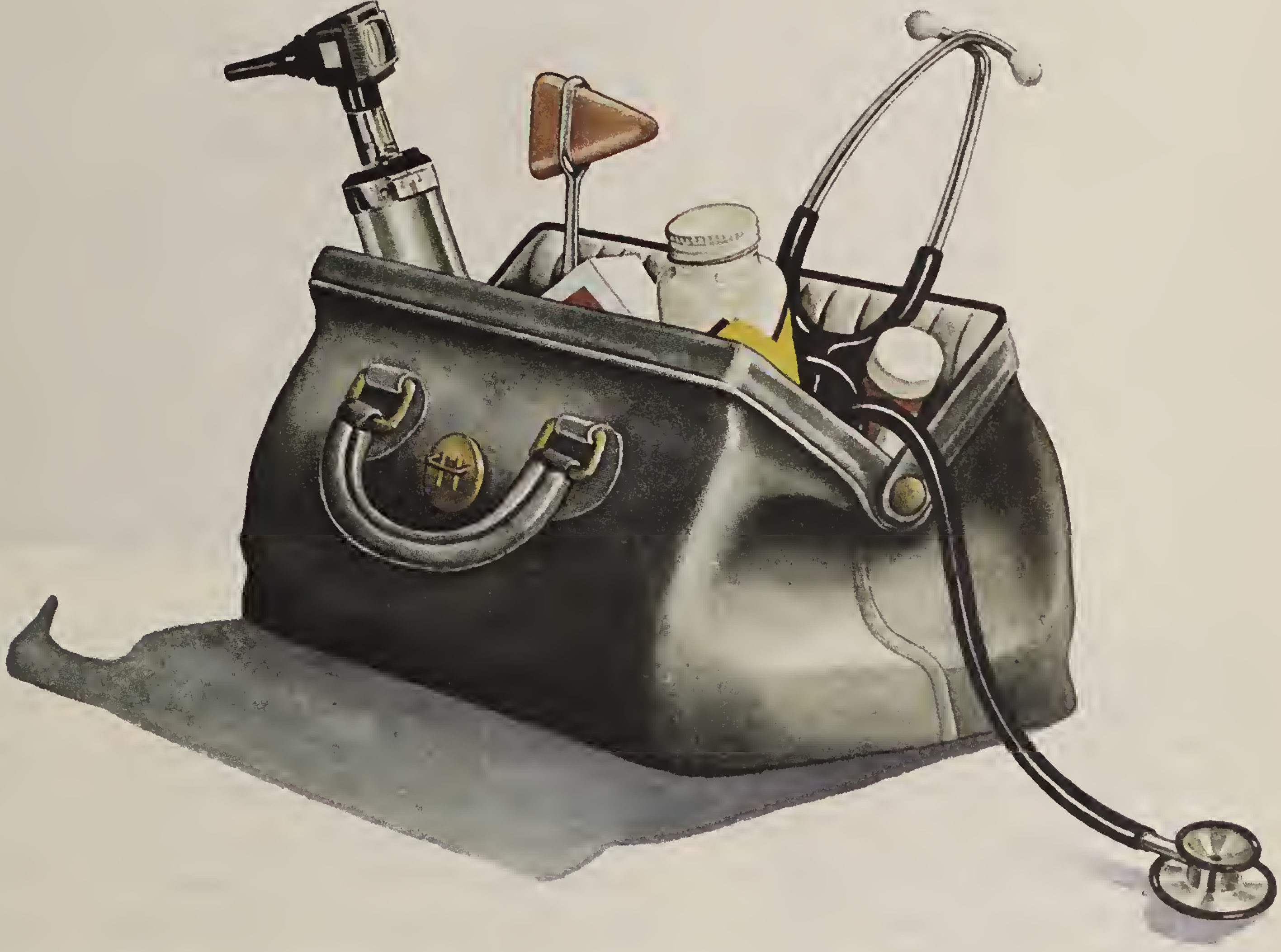
Take a look at the new applications in the development portfolio. If they are dissimilar in terms of being design- or code-intensive, for instance, you may want the flexibility of nonintegrated tools, which can apply their strengths to the application at hand.

In the end, experts warn against placing too much emphasis on tool selection. After all, the key to good software is not tools but good software management.

"The tools are disposable," says Vaughn Merlyn, chairman of CASE Research Corp. in Bellevue, Wash. "The key is for the shop to focus on the methods, the organizational learning and the things they're doing with the tools." •

Wallace is co-founder of Londahl & Wallace Consulting, a consulting firm in Warwick, Mass.

A CASE FOR STATIC UPS.



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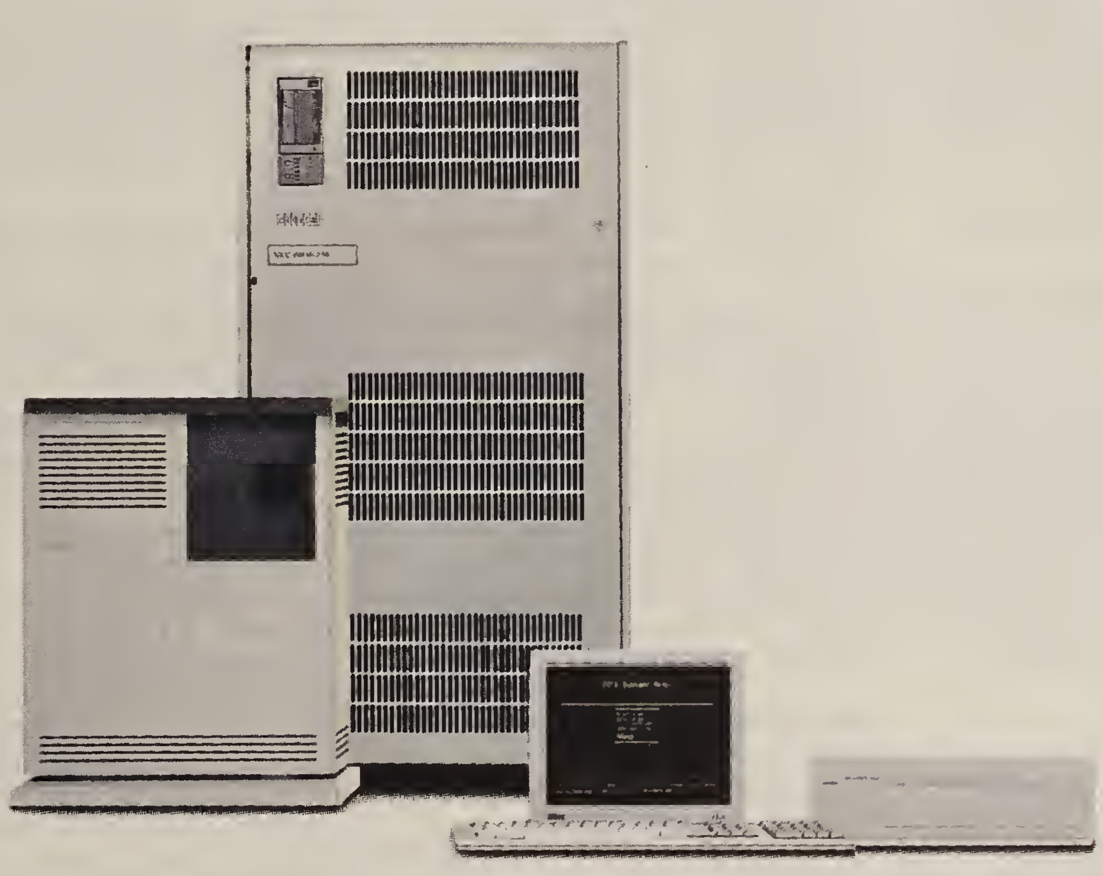

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Reverse-engineering tools

Adpac Corp.
(415) 974-6699
PM/SS
$75,000
Runs on IBM mainframes and reads assembler, Cobol and PL/1. Representations provided are calling tree, control flow, cross-reference and data flow diagrams; entity-relationship and logical data models; and structure charts. It allows analytical, cross-reference and search queries and supports the Warnier/Orr methodology. It reads Composer, DB2, IDMS and IMS data dictionaries.

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Clear Software, Inc.
(800) 338-1755
Clear Plus
$200
Runs on the IBM Personal Computer and reads C and Dbase. It provides calling tree, control flow, cross-reference and data flow diagrams as well as structure chart representations. Clear Plus allows analytical and cross-reference queries and is methodology-independent. It can read its own proprietary data dictionary.

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Digital Equipment Corp.
(800) 343-4040
Vaxscan
$757
Runs on DEC VAX and reads all languages under VMS. It provides calling tree and cross-reference diagrams as well as structure chart representations. It also allows analytical, cross-reference, custom, search and stylistic queries. The product is methodology-independent and reads the CDD/Plus data dictionary.

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Easyspec, Inc.
(713) 480-3233
Object Plus
$995 - $6,700
Runs on IBM PCs and compatibles and reads Ada, C and C++. Object Plus provides entity-relationship and logical data model representations and allows analytical queries. It supports the object-oriented Lekkos methodology and reads a proprietary, user-definable data dictionary.

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Hypersoft Corp.
(617) 864-8860
Application Browser
$3,000 - $40,200
Runs on DEC VAX, IBM PCs and compatibles and reads Cobol. The product provides calling tree, cross-reference and control flow diagrams and structure chart representations. It allows cross-reference and search queries and supports a variation of the Jackson methodology. It can read any data dictionary via a Cobol copybook import/export facility.

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Interport Software Corp.
(703) 425-6425
Intercase Reverse Engineering Workbench
$98,000
Runs on IBM PCs and compatibles and Unix-based workstations. It reads C, Cobol, CICS/BMS, IMS/MFS and job control language and provides calling tree and cross-reference diagrams, entity-relationship models and structure chart representations. Intercase allows cross-reference and inferential queries and is methodology-independent. It can read Excelerator, Pansophic, Knowledgeware and CDD/Plus data dictionaries.

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Language Technology, Inc.
(508) 741-1507
Pinpoint
$24,500
Runs on IBM System/370s and reads Cobol 68, 74, ANSI II and CICS. It provides calling tree, control flow and cross-reference diagrams and structure chart representations, allows batch cross-reference queries and supports the Yourdon methodology.

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McCabe & Associates, Inc.
(800) 638-6316
Battlemap Analysis Tool
$6,500 and up
Runs on HP/Apollo, DEC VAX, HP 9000 300 series, Sun Microsystems, Inc. workstations and provides calling tree and control flow diagrams and structure chart representations. It allows analytical, cross-reference and search queries and supports its proprietary methodology. Reads data dictionaries from Teamwork and Software Through Pictures.

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Procase Corp.
(408) 727-0714
Smartsystem
$5,250 - $17,500
Runs on Decstation, HP/Apollo machines, IBM RS/6000, Sun 3/60, Sparcstation 1 and Sun 4. It reads C and provides calling tree and cross-reference diagrams. It allows analytical, cross-reference and search queries and is methodology-independent. Smartsystem reads a proprietary object-oriented data dictionary.

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Scandura Intelligent Systems, Inc.
(215) 664-1207
Prodoc Reverse Engineer
$2,400
Runs on Intel Corp. 80286 and 80386-based IBM PCs and compatibles, Sun 386I and Sun 4. It reads Ada, C, Cobol, Fortran and Pascal and provides control flow diagrams, logical data model and user flow-form representations. The product allows analytical, cross-reference and search queries. Prodoc is methodology-independent and reads any data dictionary that can be uploaded via ASCII file format.

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Software Blacksmiths
(416) 858-4466
C-DOC Documentation Tools
$149
Runs on IBM XT, AT, Personal System/2 and compatibles; reads C and C++, provides calling and hierarchy tree, control flow and cross-reference diagrams. It allows batch cross-reference and custom report queries and is methodology-independent. It reads a proprietary data dictionary.

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SPS Software Products & Services, Inc.
(212) 686-3790
Re-Spec
$5,995 - $9,500
Runs on DEC VAX, IBM PC and compatibles and Sun workstations. It reads C, Fortran and Pascal and provides control flow and data flow diagrams as well as structure chart representations. Re-Spec allows analytical and cross-reference queries and is methodology-independent. It reads a proprietary data dictionary.

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Verilog, USA
(703) 354-0371
Logiscope
$15,000 and higher
Runs on DEC VAX, HP/Apollo, HP 9000, IBM mainframes and Sun workstations; reads Ada, assembler, Atlas, C, Cobol, Focus, Fortran, Module-2, Pascal, PDL, PL/1 and PLM86. Logiscope provides calling tree, control flow and Kiviat diagram representations; allows analytical queries; is methodology-independent; and reads a proprietary data dictionary.

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Viasoft, Inc.
(800) 622-6682
Via/Smartdoc
$19,500 - $29,500
Runs on IBM mainframes; reads OS/VS Cobol and VS Cobol II; provides calling tree, control flow and cross-reference diagrams and structure charts; allows analytical and cross-reference queries; is methodology-independent; and reads a proprietary data dictionary.

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XA Systems Corp.
(800) 344-9223
Pathvu
$50,000
Runs on IBM mainframes, Intel 80286- and 80386-based PCs and compatibles; reads Cobol; provides control flow and cross-reference diagrams and structure chart representations; allows batch analytical, cross-reference, search and stylistic queries. Pathvu is methodology-independent and can read any data dictionary with a Cobol copybook import/export facility.

CASE study

Ask five people to define "re-engineering," and you'll get five different definitions. We turned to David Sharon, president of CASE Associates, Inc. in Oregon City, Ore., to help us out in deciphering CASE terms. The charts and listings on the following pages abide by the following definitions:

- **Restructuring:** To read in source code and — by analyzing control flows and program logic — create a structured version of the original program with unchanged functionality.

- **Code analysis:** To evaluate source code for conformance to accepted programming practices, identify "dead code" or logic flaws and measure program characteristics that make them difficult to maintain (for example, logic nesting, program size, number of verbs and I/O characteristics).

- **Redocumentation:** To produce documentation with the aid of a code analyzer to assist in the maintenance process. Such documentation could include source-code comments, cross-reference lists, alias identification, control flow maps, flow charts, structure charts, data structures and calling tree diagrams.

- **Reverse-engineering:** To go through the processes of code analysis and redocumentation to identify what an existing system does. The tool may analyze 1) databases and data structures or 2) process logic and functions (or both) by transforming the existing source code into higher level design representations for creating new or updated design documentation.

- **Forward-engineering:** To design a new or replacement software system and then code-generate the new or replacement system.

- **Re-engineering:** The combined process of reverse-engineering and forward-engineering by transforming existing source code into a design repository or data dictionary so that new or improved functions can be designed and a replacement system code generated.

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PRODUCT SPOTLIGHT

Re-engineering tools

VENDOR	PRODUCT	FUNCTIONS	HARDWARE PLATFORM REQUIRED	OPERATING SYSTEMS SUPPORTED	LANGUAGES READ	LANGUAGES CREATED	DATA OR PROCEDURAL RE-ENGINEERING	REPRESENTATIONS PROVIDED	QUERIES	INTERFACES WITH WHICH OTHER CASE PRODUCTS?	TYPE OF INTERFACE TO OTHER PRODUCTS	DESIGN METHODOLOGIES SUPPORTED	DATA DICTIONARIES READ	DATA DICTIONARIES CREATED	METHOD OF USER INTERFACE	BASE PRICE
Advanced Systems Technology Corp. **(301) 441-9036**	Revengg	Code analysis, forward- and reverse-engineering, maintenance, redocumentation	DEC VAX, HP, IBM PC and compatibles	DOS, Unix, VMS	Cobol, Fortran, JCL	Same	Both	Calling trees; control flow, cross-reference and data flow diagrams; entity-relationship and logical data models; structure charts	Analytical, custom, search	Excelerator, Design Aid, Sylva/Foundary	Import/ Export, proprietary bridge	Methodology-independent	Any that can be accessed via ASCII file format	Same	Command line	$9,000-$60,000
Advanced Technology International, Inc. **(212) 354-8280**	Supercase SCI	Design recovery, forward- and reverse-engineering, maintenance, redocumentation	DEC VAX	VMS	Fortran	Ada, C, Fortran, Jovial, PLM	Procedural	Calling trees, cross-reference diagrams, structure charts	Analytical, cross-reference, search	Excelerator	Proprietary bridge	Methodology-independent	Excelerator	DEC's RDB	Command line, menu	$15,000
American Management Systems, Inc. **(703) 841-6000**	Life-cycle Productivity System	Code analysis, design recovery, forward- and reverse-engineering, maintenance, restructuring	IBM PC 286 and higher, 30 series, 43 series, DEC VAX	CICS, DOS, IDMS DB/DC, IMS DB/DC, MVS, OS/2, Unix, VMS	Cobol	Cobol	Both	Calling trees; control flow, data flow and state transition diagrams; CPM network diagrams and matrices; entity-relationship and logical data models, presentation graphs; structure charts; work breakdown structure	Analytical, cross-reference, search	APS Customization Facility, Excelerator, Micro Focus Cobol, Project Workbench	Proprietary bridge	Methodology-independent	Excelerator	Excelerator	Command line, menu, window-oriented	$12,000
Bachman Information Systems, Inc. **(617) 273-9003**	The Bachman/Re-engineering Product Set	Code analysis, forward- and reverse-engineering, maintenance, restructuring	386-based IBM, Compaq workstations	DOS	DB2 DDL, IDMS Schema DDL and DDDL, IMS DBD, Cobol data descriptions, VSAM data structures	DB2 DDL, IDMS DDL	Data	Bachman diagrams and DB2 diagrams, entity-relationship and logical data models	Analytical, cross-reference	Excelerator, Knowledgeware IEW	Import/ Export	Methodology-independent	DB2 Catalog, IDMS	Same	Window-oriented	$15,000-$60,000
David R. Black & Associates **(216) 688-2741**	Explain	Code analysis, forward- and reverse-engineering, maintenance, redocumentation, restructuring	DEC VAX, IBM PC and compatibles, Prime	DOS, Primos, Unix, VMS	CICS, Cobol, SQL, DB2	Same	Procedural	Calling trees, cross-reference and data flow diagrams, logical data models	Analytical, cross-reference, search	Black's Cobol Program Generators	Full integration	Methodology-independent	CDD/Plus	Same	Command line, menu	$25,000
CGI Systems, Inc. **(800) 722-1866**	Pacbase and Pacreverse*	Code analysis, design recovery, forward- and reverse-engineering, maintenance, redocumentation	IBM	MVS, OS/2	Cobol	Same	Data	Control flow and data flow diagrams, entity-relationship and logical data models, structure charts	Analytical, cross-reference, search	Open architecture	Import/ Export	Martin, Merise, Yourdon, custom	Cobol-based [data description]	Proprietary	Command line, menu	$95,000
Chen & Associates, Inc. **(504) 928-5765**	Reverse-DBMS	Design recovery, forward- and reverse-engineering, redocumentation, restructuring	IBM PC AT, XT, PS/2	DOS	C	C	Data	Entity-relationship models	Cross-reference	Design Aid, Excelerator, IEW	Import/ Export	Chen, Martin, Yourdon, Gane and Sarson, DeMarco	CA's IDD, Datacom, CDD/Plus, Data Manager, IBM DB/DC, Computer Corp. of America's Model 204	Same	Window-oriented	$1,995 +
Cortex Corp. **(617) 894-7000**	Corvision	Design recovery, forward- and reverse-engineering, maintenance, redocumentation, restructuring	DEC VAX, IBM PC AT	DOS, VMS	All VMS languages	Same	Both	Calling trees, cross-reference and action diagrams, entity-relationship and logical data models	Cross-reference, search	Excelerator, IEW, DEC products	Import/ Export	Methodology-independent	CDD/Plus, Knowledgeware Encyclopedia, Excelerator	Same	Command line, menu, window-oriented	$40,000
Deft **(416) 249-2246**	Deft CASE System	Design recovery, forward- and reverse-engineering, redocumentation	DEC VAX, Macintosh	Macintosh, VMS	SQL	SQL	Data	Data flow diagrams, entity-relationship model, structure charts	Cross-reference	Any that can be accessed via ASCII file format	Import/ Export	Gane and Sarson, Chen/ Bachman, Yourdon	CDD/Plus, Ingres, Oracle, Sybase	Same	Window-oriented	$2,900
Digital Equipment Corp. **(800) 343-4040**	Ultrix Programming Environment	Code analysis, forward- and reverse-engineering, maintenance, redocumentation, restructuring	Decstation, VAX	Unix	Ada, C, Cobol, Fortran, Pascal	Same	Both	Calling trees, cross-reference diagrams	Analytical, cross-reference, search, stylistic	Teamwork, Software Through Pictures, Statemate, Procase, Sabre C	Bridge	Methodology-independent	Any SQL-based	Same	Command line, menu, window-oriented	Included with Ultrix operating system

[1] Available for individual third-quarter 1990.

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT	FUNCTIONS	HARDWARE PLATFORM REQUIRED	OPERATING SYSTEMS SUPPORTED	LANGUAGES READ	LANGUAGES CREATED	DATA OR PROCEDURAL RE-ENGINEERING	REPRESENTATIONS PROVIDED	QUERIES	INTERFACES WITH WHICH OTHER CASE PRODUCTS?	TYPE OF INTERFACE TO OTHER PRODUCTS	DESIGN METHODOLOGIES SUPPORTED	DATA DICTIONARIES READ	DATA DICTIONARIES CREATED	METHOD OF USER INTERFACE	BASE PRICE
Digital Equipment Corp. **(800) 343-4040**	Vaxset with Program Design Facility	Code analysis, design recovery, forward- and reverse-engineering, maintenance, redocumentation, restructuring	VAX	VMS	All VMS languages	Same	Procedural	Calling trees, cross-reference diagrams, structure charts	Analytical, cross-reference, search	CDD/ Plus	Full integration	Methodology-independent	CDD/Plus	Same	Command line, window-oriented	$4,365
Knowledgeware, Inc. **(800) 338-4130**	Information Engineering Workbench (IEW)	Design recovery, forward- and reverse- engineering, redocumentation	IBM PC and compatibles, mainframes	DOS, MVS	Any that are structured and procedural	Cobol	Both	Cross-reference and data flow diagrams, entity-relationship and logical data models, structure charts	Analytical, cross-reference, search	Bachman, Sage, Pansophic, Synon, Asset, Lansa	Import/ Export	Chen, DeMarco, Gane and Sarson, Martin, Yourdon	Adabas, ADR, Data Manager, IBM, IDD	Same	Window-oriented	$8,625
	Application Development Workbench (ADW)	See above	IBM PC and compatibles, mainframes	OS/2, MVS	Any that are structured and procedural	Cobol	Both	See above	See above	See above	Import/ Export	See above	See above	Same	Window-oriented	$8,625
Menlo Business Systems, Inc. **(415) 948-7920**	Foundation Vista	Forward- and reverse- engineering, maintenance, redocumentation	All Macintosh	Macintosh	Cobol, DDL, Structured Cobol	Same	Both	Cross-reference, control and data flow diagrams; entity-relationship and logical data models; forms/ screens; structure charts	Cross-reference	Foundation, Tandem Pathmaker	Import/ Export, full integration, proprietary bridge	Gane and Sarson, Jackson, Yourdon	Ingres, Nonstop SQL-based	Same	Menu, window-oriented	$8,900-$16,000
Mentor Graphics Corp. **(503) 626-7000**	CASE Station	Code analysis, design recovery, forward- and reverse- engineering, maintenance, redocumentation, restructuring	Apollo workstations	Unix	C, Fortran	C code frames	Procedural	Calling trees, control flow and data flow diagrams, entity-relationship models, structure charts, real-time tables	Analytical, cross-reference, search	Code Link Station, Context DOC TPS	Full integration	Methodology-independent	Any that can be accessed via ASCII file format	Same	Command line, menu, window-oriented	$12,450
	Code Link Station	See above	Apollo workstations	Unix	Assembler, C, business source codes	Assembler, business source codes	Procedural	Object code, registers, structure charts	Analytical, cross-reference, search	CASE Station, Context DOC TPS	Full integration	Methodology-independent	See above	Same	Command line, menu, window-oriented	$17,950
Meta Systems Ltd. **(313) 663-6027**	Revengg	Code analysis, design recovery, forward- and reverse-engineering, maintenance, redocumentation, restructuring	DEC VAX, Microvax, IBM mainframe, PC AT and compatibles, Pyramid UTX/32	DOS, MVS, Unix, VMS	Assembler, AYK 14, C, CMS II, Cobol, Fortran, JCL, PL/I	C, Cobol, Fortran	Both	Calling trees; control flow, cross-reference and data flow diagrams; logical data models; structure charts; matrix, data path and file layouts	Analytical, cross-reference, search, stylistic	Design Aid, Excelerator, Teamwork	Import/Export, full integration, proprietary bridge	Methodology-independent	Datamanager, DB2	Same	Command line, menu, window-oriented	$6,995-$150,000
Micro Focus, Inc. **(415) 856-4161**	Micro Focus Cobol/2 Workbench	Code analysis, forward- and reverse- engineering, maintenance, redocumentation	IBM PC AT, XT, PS/2 and compatibles	DOS, OS/2	Cobol	Same	Both	Control flow and cross-reference diagrams, structure charts	Cross-reference, search	Excelerator, Knowledgeware, Sage, Telon	Full integration, proprietary bridge	Methodology-independent	Proprietary	Proprietary	Command line, menu	$3,290
Price Waterhouse **(213) 396-3844**	Arrae	Code analysis, design recovery, forward- and reverse-engineering, maintenance, redocumentation	IBM PC, PS/2, mainframe and compatibles	DOS, MVS, OS/2, VMS	CICS, Cobol, DL/I, VSAM	CICS, Cobol, SQL, VSAM	Both	Calling trees, component worksheets, structure charts	Cross-reference, data usage, search	Bachman, Excelerator	Import/ Export	Methodology-independent	DB2 Catalog, Index XLD, IMS, proprietary	Same	Command line, menu	NA
Reasoning Systems, Inc. **(415) 494-6201**	Refine	Code analysis, design recovery, forward- and reverse- engineering, maintenance, redocumentation, restructuring	Unix-based workstations	Unix	Ada, C, Cobol, Fortran, JCL, Natural, SQL	Same	Both	Calling trees; control flow, data flow and cross-reference diagrams; entity-relationship and logical data models; structure charts	Ad hoc, analytical, cross-reference, search	Any with a published text interchange format	Import/ Export	Executable specifications, object-oriented, prototyping	Any with a published text interchange format	Same	Command line, hypertext, menu, window-oriented	$9,900-$14,900
Scandura Intelligent Systems, division of Intelligent Micro Systems, Inc. **(215) 664-1207**	Prodoc Renusys Workbench	Code analysis, design recovery, forward- and reverse-engineering, maintenance, redocumentation, restructuring	IBM PC 286, 386 and compatibles, Sun	DOS, OS/2, Unix	Ada, C, Cobol, Fortran, Pascal, generic source capability	Ada, C, Cobol, Fortran from pseudocode, Pascal	Both	Control flow and data flow diagrams, entity-relationship and logical data models, user flow forms	Analytical, cross-reference, search, stylistic, custom reports	Any that can be accessed via ASCII file format	Import/ Export	Methodology-independent	Any that can be accessed via ASCII file format	Same	Command line, menu, window-oriented	$3,600
Software Systems Design, Inc. **(714) 625-6147**	Aisle Family	Code analysis, design recovery, forward- and reverse-engineering, maintenance, redocumentation, restructuring	Apollo, Data General, HP 9000, IBM 386-based PC and compatibles, DEC VAX	DOS, Unix, VMS	Ada, C	Same	Procedural	Calling trees; Booch, cross-reference and data flow diagrams; structure charts	Cross-reference, search	Excelerator, Software Through Pictures, Teamwork	Proprietary bridge	Methodology-independent	Excelerator, Teamwork, IDE	Proprietary	Command line, menu	$5,000-$60,000
Viasoft, Inc. **(800) 622-6682**	Via/Center	Code analysis, design recovery, forward- and reverse-engineering, maintenance, redocumentation, restructuring	IBM mainframe	ESA, MVS	OS/VS Cobol, VS Cobol II	Same	Both	Calling trees, control flow and cross-reference diagrams, structure charts	Analytical, browse, cross-reference, search	Knowledgeware, Netron, Sage	Import/ Export	Methodology-independent	Proprietary	Proprietary	Command line, menu, window-oriented	$29,500-$99,500

Traditionalists and true believers

Computer zealots and phobics can drive you crazy

BY JONATHAN C. PATRICK

Scanning the latest information technology journals should quickly convince you that there are more good ideas than shops to implement them and more ways to solve business problems than firms that have problems.

So why do information systems managers knee-deep in advice and "solutions" continue to join line managers in bemoaning the high cost and poor results of information technology initiatives?

The reason is simple, although not self-evident: In approaching "systems problems," industry mavens often fail because they do not deal with two big roadblocks found in many organizations:

- A stubborn, traditionalist culture determined to prove — at any cost — that information technology does not pay for itself.
- An equally stubborn cult of "true believers" who worship a grand design, a black box or a computer guru who has The Answer.

Both groups can kill an information technology project faster than you can read the average advice column. Both prevent the honest appraisal, development and deployment of information technology.

Traditionalists underestimate the potential of technology to transform a business. They tend to focus on short-term cost benefits and boldly declare that a system's cost is not equal to its perceived benefit. Decisions about information systems are based on a lack of faith. As a result, traditionalists delay the inevitable replacement of poor systems with systems only slightly better.

Faith and messiahs

Having too much faith in technology, true believers often overestimate the weakness of the old system and the strength of its replacement. This fosters a series of false starts that improve by accident rather than by analysis, as each succeeding IS messiah reinvents his predecessors' applications using the newest systems methodology or development tool.

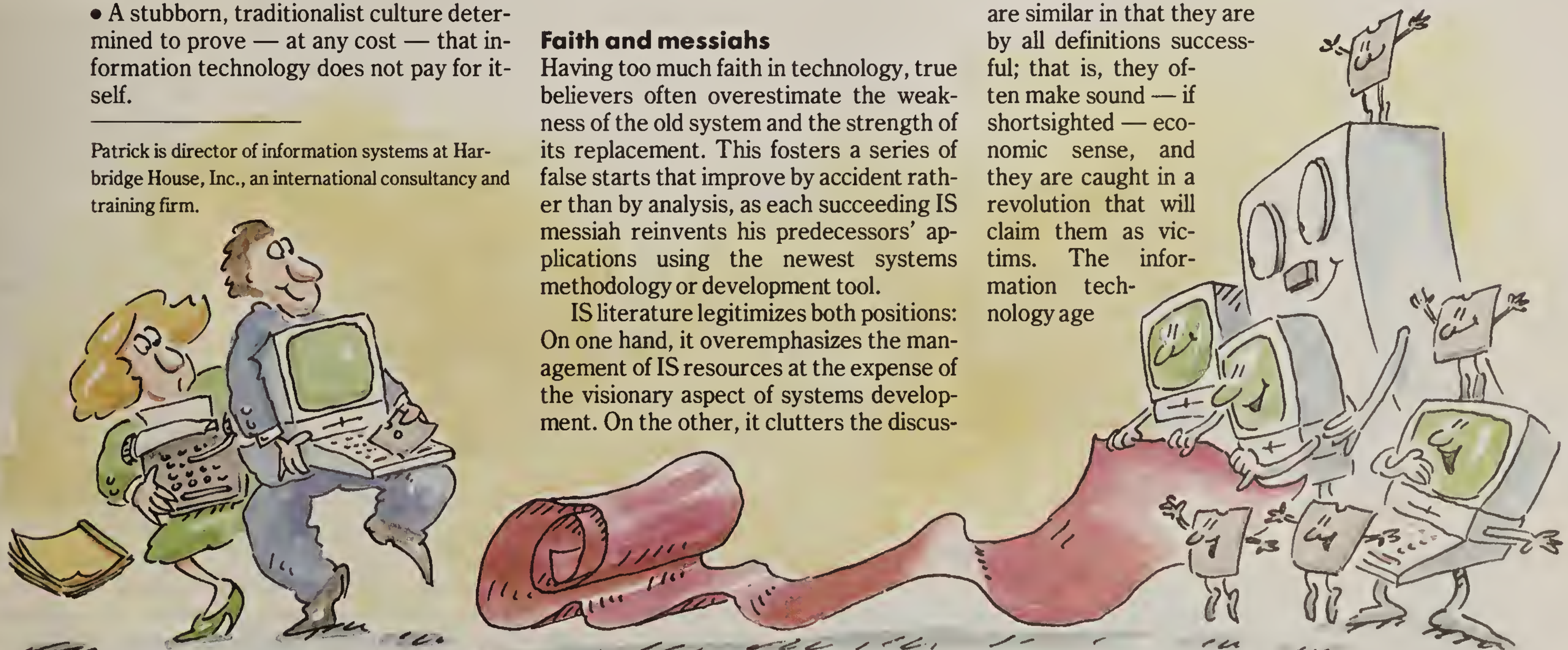
IS literature legitimizes both positions: On one hand, it overemphasizes the management of IS resources at the expense of the visionary aspect of systems development. On the other, it clutters the discussion with endless debates on the light at the end of the technology tunnel.

If IS managers are to be truly effective in their jobs, they must identify and deal with both types (see story page 82).

Traditionalists are easily spotted; they are the same people who locked themselves to their typewriters and yellow pads rather than embrace a personal computer. This cyberphobic breed falls into three broad categories:

- People who achieved their current success without computers (or so they believe).
- People who allow computers to be used only when the numbers tell them to do so.
- People who are comfortable with nonelectronic technology, for example, publishing and marketing applications.

In each case, the groups are similar in that they are by all definitions successful; that is, they often make sound — if shortsighted — economic sense, and they are caught in a revolution that will claim them as victims. The information technology age



Illustrations by Chris Demarest

Patrick is director of information systems at Harbridge House, Inc., an international consultancy and training firm.

- IS *can* handle these project killers
- Virtue lies in the middle
- The secret: Get everyone involved

of the 1990s will show a "take no prisoners" attitude toward organizational structure and reporting relationships. A manager who is a member of the pre-electronic generation who refuses to use a computer will sooner or later be squashed out of a job by the predicted flattened organization.

Of course, such managers are not completely without value; in mission-critical applications, a good dose of financial sanity-checking is warranted. However, if your company is spending more time cost-justifying software than using it to solve business problems, you are falling behind your competitors.

It's ironic, but the same people who spend years becoming experts in tax accounting, government contracting or financial regulations — and who are also skilled sailors or golfers — know more about the inner workings of their microwave ovens, videocassette recorders and automobiles than they do about their PCs.

The new kid

Traditionalist culture is self-perpetuating. The conventional wisdom is that "it costs more for me to do it." Sure it does for a while, but at some point, computerizing costs less and involves fewer people.

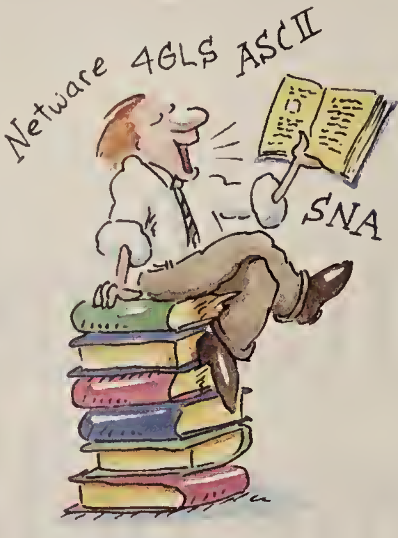
Smart managers use technology as another way to display leadership, just as they would use the company's products to demonstrate commitment to the firm and to meet corporate goals.

In contrast, management that still uses paper pads, secretaries and financial analysts instead of word processing, electronic mail and spreadsheet software communicates that the firm is not serious about competing with information technology. It also communicates that the information technology contribution is, at best, appropriate for low-level, back-room staff, and at worst, suspect. The message may be subtle, but it pervades traditionalist culture.

Traditionalists are fond of literature that reinforces the notion that good management is a "numbers game" or a financial analysis exercise in which there is only one answer. Companies that rely on this kind of information technology management are fated to pick at the remains of other firms' "kills," because they will never undertake an IS initiative in which the short-term benefits are vague and the long-term benefits are risky.

The ongoing debate on outsourcing is the last gasp of traditionalists, who argue that information technology can be handled better and cheaper by a third party.

Outsourcing is the latest tactic employed by financially minded managers who emerged during the 1970s and 1980s to run businesses by the balance sheet. Unfortunately, outsourcing is similar to moving manufacturing off-shore to gain short-term cost efficiencies while ignoring the long-term loss of domestic manufacturing expertise.



The power reader

To be sure, tough-minded financial managers are important. But their input should not be more important than that of production, marketing, human resources, sales and technology departments. Firms that dwell on short-term costs drive out the functional expertise required to develop, manufacture and market new products.

Outsourcing systems also deprives a firm of the ability to be creative, to leapfrog the competition, to respond quickly, to provide a unique solution and to deploy multiple vendor strategies. Why not outsource the finance department or the human resources division?

The reason is that a firm is not a series of organizational charts and budget reports that can be drawn and redrawn to achieve an optimal mix. An organization is a sometimes rowdy, often difficult collection of competing professionals with different cultural backgrounds and educations who need to be led by committed managers with strong, sincere visions for the company.

Outsourcing systems will not correct fundamental organizational or management dysfunction or create a market for a lackluster product. But it will leave the traditionalists in charge of the firm.

In daily life, true believers can have a more insidious effect than the traditionalists, preventing business from fully using its technological and human resources. True believers are convinced that the next system, the next guru, the next software release, a different vendor or a different standard will solve today's business problems.

The recent revival of the guru cult in trade literature often depicts IS professionals as magicians and wizards. While this near-mystical status acknowledges the specialized skills needed by the technologist, it also suggests that IS requires unnatural management and functional expertise.

Ironically, the cult re-emerges at a time when many IS people are spending a great deal of time trying to demystify systems and otherwise bury the notion of the black box and the systems priesthood. After all, that's what gave IS a bad name in the first place.

Despite such demystification efforts, the commitment of IS professionals is continually challenged — the result of havoc wreaked by true believers and the people they influence in the user community.

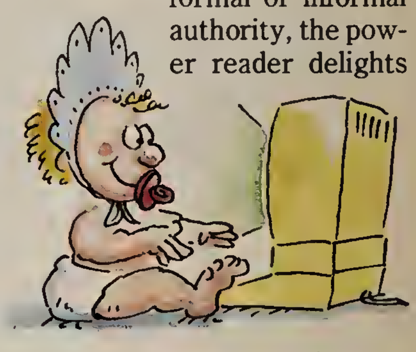
Harboring a deep belief in the magic of technology, true believers naturally hold that hard work is unnecessary; software that takes more than 10 minutes to figure out or applications that take more than one day to develop are too complicated, too costly and too technical, they say.

True believers love literature that reinforces state-of-the-art technology and the need to rework and rewrite applications.

A company culture dominated by true believers will find it impossible to build applications that can support growth because their applications are, by definition, the "light at the end of the tunnel," or the sure thing.

There are two classes of true believers found at every level of an organization: the "power reader" and the "new kid on the block."

The power reader, as distinguished from the "power user," has read enough to be dangerous but actually understands little of the current technology. The power reader knows there are 4GLs, SQLs, ASCII conversions, Postscript, SAA, SNA, Netware and Next. When armed with good communication skills and formal or informal authority, the power reader delights in endless wrangling over the merits of new applications.



The next generation

The power reader believes in standards only when they are not employed in his environment.

For the power reader, there is no justification for a 70%, 80% or 90% solution. Power readers don't believe in phased implementations or prototypes; both terms defy the messages in press releases: "You can have it all now."

The power reader delays systems implementation but for a different reason than the traditionalist. While the latter cannot approve a computer solution without fixed debits and credits, the power reader cannot decide because there are too many alternatives. He may make so many choices that colleagues have no clear idea of the technology direction.

In contrast, the new kids on the block can have a radioactive effect on systems evolution. They are driven by the need to have the best computer system and newest release.

Otherwise orderly evolutions of systems suddenly mutate in the hands of the new kids. Mainframes become distributed minicomputers; distributed minicomputers become client/server local-area networks.

In slight defense, some firms require a new kid, particularly those that have skimped on systems spending. Unfortunately, by basing his contribution on

Guiding light

Are you willing to accept the challenge of helping to lead your organization into new markets instead of merely watching from the back room? The following are a few suggestions to help you get there:

- **Spend as much money as possible on information technology.** It sounds paradoxical in tighter economic times, but now is no time to be conservative about investing in hardware and software. There is no longer time for a 1970s line of thinking about grand designs. In the 1990s, organizations must be able to use a new tool faster and better than their competitors. Cutting back on information technology investments is like cutting their collective throats. There is no room here for the timid.

Help decide how close to the technological edge your business needs to be and spend the money to stay there.

- **Do not set up arbitrary rules for cost/benefit analysis.** However, you still need to track budgets and expenses closely. Trusting employees to get the most out of financial software is not an excuse for poor management control and accounting.
- **Make sure you spend all your IS money.** It does no good to have a positive balance in your IS expense accounts at year's end if you are doing things the same old way or haven't learned anything new. Shops need to invest in research and development as well as training and should encourage users to experiment.
- **Hire computer-literate employees.** New employees should be interviewed by senior IS staff to assess their information technology competency. All things being equal, proficiency with machines may be enough to make the choice. The reason? An employee who needs nothing but a short introduction to your facility's architecture will cost much less than one who knows little about it.

It's also important to distinguish between a person who "talks" a good information technology game and a person who really understands. Find out what a person has really accomplished and how he accomplished it. Most human resources personnel and most operating managers cannot tell the difference and frequently overestimate an employee's computer literacy.

- **Reward people who use information technology to improve business.** Firms repeatedly reward employees for short-term contributions in increasing sales or avoiding costs. Why not do the same for a system change that can yield years of benefit? Lobby to gain recognition for effective technology use. Take steps to remove from mission-critical applications employees who are not at the leading edge of technology in their field.
- **Be flexible about IS standards.** Every IS manager knows that organizational standards help protect computing resources while ensuring good service, pricing and software support. Still, it's important not to universally restrict the use of software or hardware for arbitrary architecture issues.

Whether you are distributed, centralized or both, information technology planning should not hinder or restrict the firm's creativity or innovation. There is no right answer here except that the information technology organization should mirror the overall firm's organization.

JONATHAN PATRICK

knowing something his colleagues do not, the new kid perpetuates black box theories. He therefore spends more time staying ahead of the power readers and the newer kids on the block than in ensuring that the organization and its systems are in sync.

The next generation

Many systems people — surrounded by traditionalists, true believers and a perceived lack of user investment — believe that IS must provide no-brain solutions. IS can only hope that this attitude will not survive the current generation.

It is time for users to stop complaining and to invest their own time in learning about information technology by doing. A Saturday morning spent hacking around an organization's standard word processing software with the manual open is more valuable than the same number of hours devoted to memorizing keystrokes.

The competition within and between companies for jobs, salary and careers will soon depend on information technology skills as well as on communication and functional expertise.

The belief that information systems are merely an office automation tool or the rationalization of existing tasks is a dead religion bequeathed by pre-electronic generations and the traditionalist managers.

The new employee uses the PC to create value, to add to the company, to do things that weren't done before — and this person rarely needs or wants the kind of training drill on which the established employee insists.

Newer employees — both IS and non-IS — will jump ship if they perceive that a company is not committed to superior technology.

In the end, the culture dominated by true believers makes no more progress than one ruled by traditionalists.

Virtue in the middle

In fact, a business tilted in either direction will fail to develop a coherent, sensible, aggressive technology strategy. In the former case, thrashing prohibits steady progress. In the latter, progress is stifled by the inability to make any move.

To achieve a healthy and desirable balance, IS professionals must counter the effects of traditionalist and true believer elements in their corporate cultures. The secret is to play a traditionalist role when true believers threaten the firm and to play a true believer role when traditionalists hold the firm back.

If *every* employee is not actively and intelligently involved in advancing information technology, the organization's objectives are at risk.

IS managers must take a leadership role in determining their firm's fate and foster a culture that is not dominated by traditionalists or true believers. ●

'I am not a wizard'

Information systems people are not wizards. What I do is not magic. When I don't know the answer, I read a manual. I openly ask vendors to solve problems. I hire consultants. I go to school. I work nights and weekends. I have never programmed an incantation to forecast current year sales (although I would do it in a minute if I thought it would work). My telecommunications plans do not include a mind-meld with Mr. Spock. I am not telepathic. I am an IS professional.

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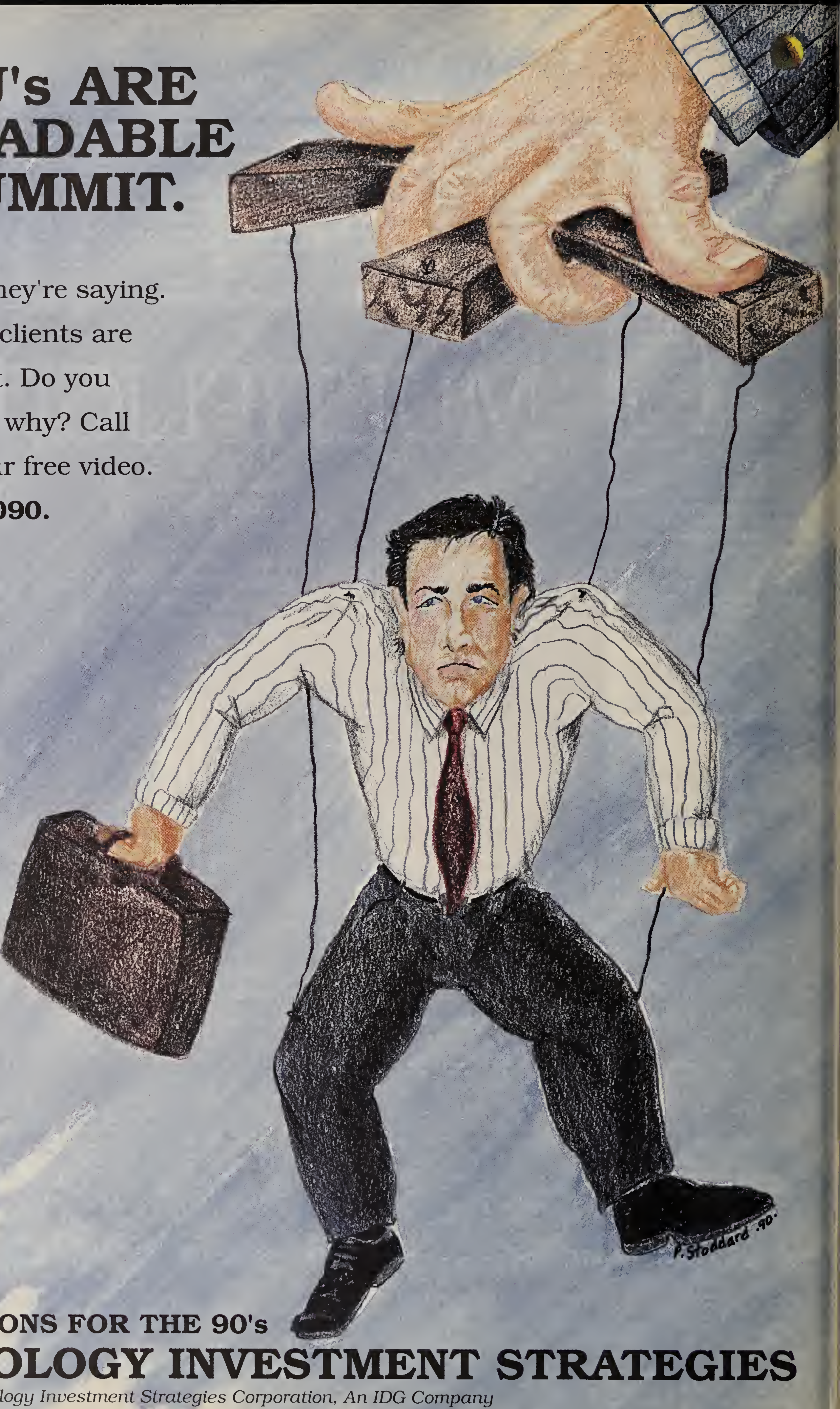

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All hands on DEC

Executive information systems vendor **Comshare, Inc.**, has said it likes partnering in the IBM-based software world. Now it's advancing the idea on **Digital Equipment Corp.**'s platform via a three-firm alliance that includes financial applications software and consulting services.

……

Seven-year itch

A strategy that has been in the works for seven years, according to the firm, last week culminated in the election of **Paul A. Allaire** as chief executive officer of **Xerox Corp.** The former Xerox president and head of Business Products and Systems replaces **David T. Kearns**, who will continue as chairman.

……

Up the ranks

Encyclopaedia Britannica, Inc. named executive director of planning and development **Norman J. Bastin** senior vice-president and general manager at **Britannica Software, Inc. and Del Mar Group, Inc.** Software developer Del Mar, acquired last month, is seen as a major aid to the publisher's push into electronic publishing.

EDI matches strike user interest

By marrying EDI to other technologies, vendors can make honeymoon last for users

BY JOANIE M. WEXLER
CW STAFF

Now that thousands of companies have developed some level of comfort with electronic data interchange — the computer-to-computer transfer of business transactions — there may be opportunities for vendors to make EDI more useful by creatively merging it with other technologies.

TSI International, Inc., for instance, targeted EDI as a strategic fit with its own Key/Master mainframe data input software. To help make the match, Norwalk, Conn.-based TSI acquired Atlanta-based EDI vendor Transettlements, Inc.'s EDI translation software product, Translate.

"We determined that EDI was adjoining our market in that it was a new form of data input," noted Constance Galley, TSI president and chief executive officer. "There is lots of data that our customers are keying in today that will eventually be input faster and more accurately using EDI." The acquisition also brought Transettlements' installed base of approximately 200 into the TSI fold.

EDI provides TSI with a new avenue of approach to its current Key/Master installed base of 2,000. Before the Transettlements venture, TSI had already decided to move into EDI and had developed an integrated EDI package, Trading Partner, that provides translation software, communications and applications gateways and administrative and auditing software.

Galley predicted that TSI will have two translation products in the market for at least three years but will eventually replace its product with Transettlements' Translate package.

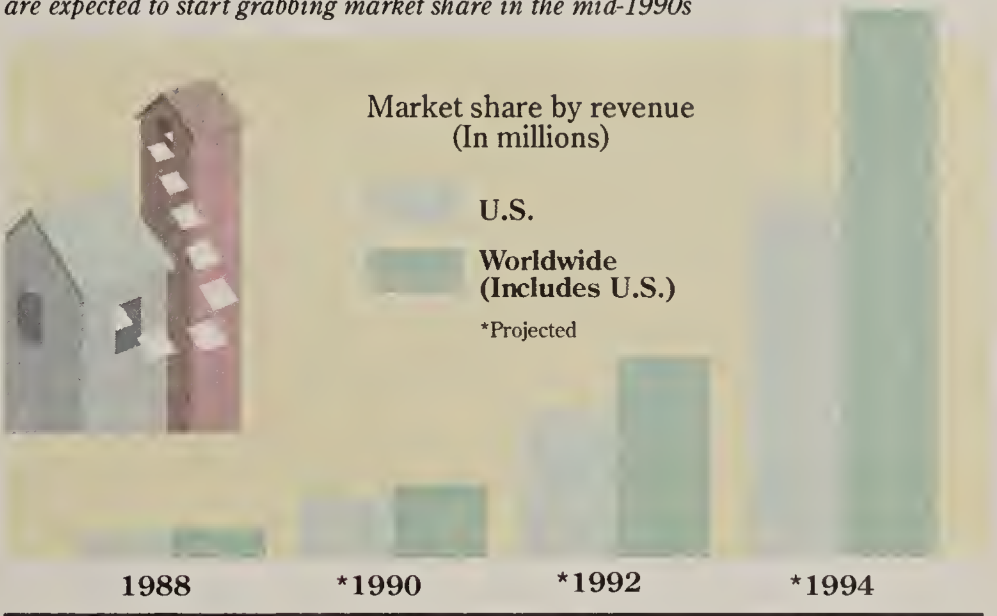
Transettlements sold Translate because "we were faced with a large development exercise to leapfrog our competition, and we weren't up to it," said Craig Wilson, vice-president of sales and marketing. The firm will continue to offer its EDI network services.

That competition includes Sterling Software/Ordernet Services, which recently purchased Metro-Mark Integrated Systems, Inc., a maker of EDI translation software.

Such mergers can edge out smaller suppliers. "The EDI market — about $140 million in 1989 — is not large enough to support all the vendors," noted Vic Wheatman, program director of interenterprise systems in the Santa Clara, Calif., office of Gartner Group, Inc.

A step ahead

The U.S. discovered EDI several years before the rest of the world and currently represents the dominant share of the growing global EDI market. But other countries are expected to start grabbing market share in the mid-1990s



Source: Gartner Group

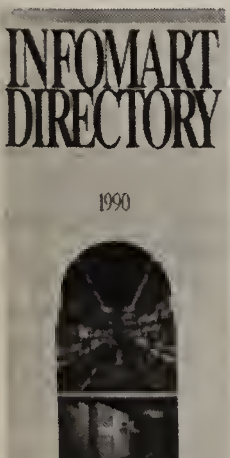
CW Chart: Marie Haines

Wheatman suggested that the future of EDI depends on its integration with application programs. "Some of the major application providers, such as [the former] Management Science America, Inc. and American Software, need to provide an EDI capability as part of their software," he said. "They are now using third-party solutions that aren't as neatly integrated."

Some network service companies are looking to partner with turnkey systems sellers peddling specialized hardware/software packages into niche markets, such as advertising, health insurance and government, Wheatman said.

EDI is generally considered a fledg-

Continued on page 88



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Waiting begins in Lotus lawsuit

ANALYSIS

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — It could be year's end before a decision is returned in the first phase of Lotus Development Corp.'s copyright suit against two small software concerns — Paperback Software International, Inc. and Mosaic Software. The suit was filed in federal district court 3½ years ago.

Attorneys for Paperback and Lotus presented final arguments to Judge Robert E. Keeton two weeks ago, and now the wait is on. Many observers said the result is a foregone conclusion: They expect a Lotus win.

"If Lotus wins, it will reflect a confirmation that you just can't copy screen displays," said Ken Wasch, executive director of the Washington, D.C.-based Software Publishers Association.

Paperback maintained that it has been an accepted practice within the desktop software industry to build upon the technical foundations of existing products. However, Wasch said it is not acceptable to copy as closely as Paperback did.

On this point, Paperback got some help from a surprising corner. Lotus founder and former Chairman Mitchell Kapor was a Lotus witness, although some observers said that they thought he came across as sympathetic to the defendants.

In testimony several weeks ago before a House subcommittee on software copyright, Kapor, now head of On Technology, said: "I don't see any way to prevent my potential competitors from profiting from our efforts. If they can replicate our efforts or go them one better — because our approach inspired them to do so — then more power to them. I'd only call in a lawyer if I found that they had copied the actual lines of code underlying [the product]."

That, said Paperback attorney David A. Guberman, a partner at Sherin and Lodgen in Boston, pretty much sums up the defendants' position. "We are entitled to look at 1-2-3," he said.

More than one way

Wasch disagreed. "If Lotus loses, there will be a field day for imitators," he predicted. Lotus supporters maintained there are different ways to design a spreadsheet; it does not have to look just like 1-2-3. "Yet, given the advertising and presentation of [Mosaic's] Twin and Paperback's [VP Planner], they [clearly] were intended to be Lotus clones," Wasch said.

Software developers such as Dan Bricklin, the creator of Visicalc, on which 1-2-3 is said to be based, fear a "chilling effect" on future software development and advancement if Lotus wins. In his affidavit, Bricklin predicted the onslaught of massive lawsuits launched against works sharing similar external designs.

First, however, Judge Keeton will have to decide what is copyrightable. Lotus attorneys have persistently maintained that 1-2-3 is copyrightable in its entirety, including the menus and screen displays that the firm claimed were copied.

Guberman maintained that Congress singled out only a computer's set of instructions as copyrightable.

Screen displays and menus are separate works, he said. Some screen displays are little more than blank forms and so are not copyrightable, he added. Menus, which function as the means by which users access and activate instructions, are not copyrightable because they are not instructions, according to Guberman.

The defendants admitted they copied (and expanded upon) 1-2-3's menu and that they had every right to do it, Guberman said. The question now is whether the judge will agree.

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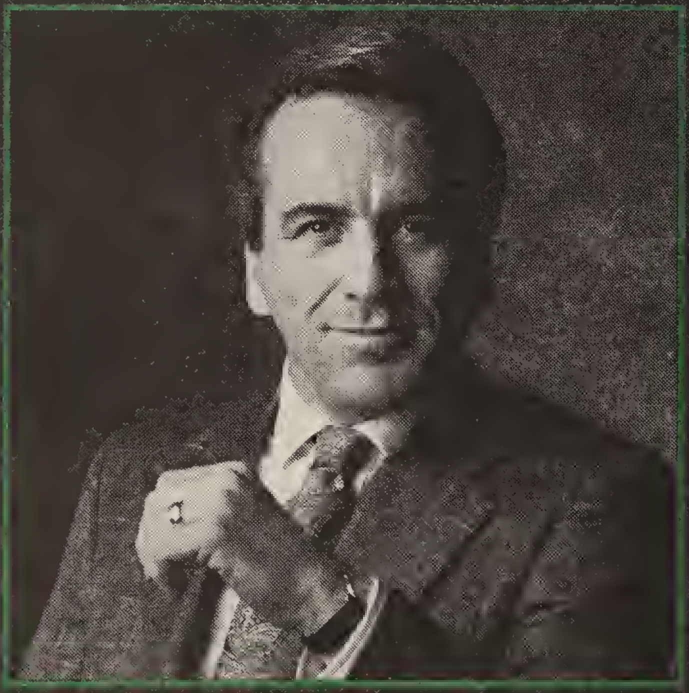

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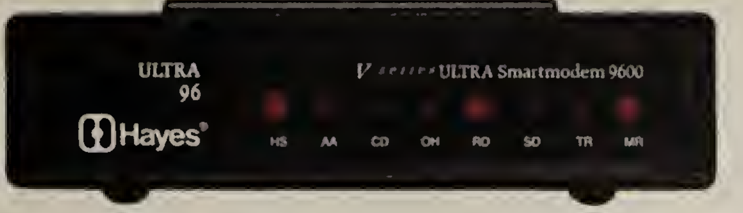

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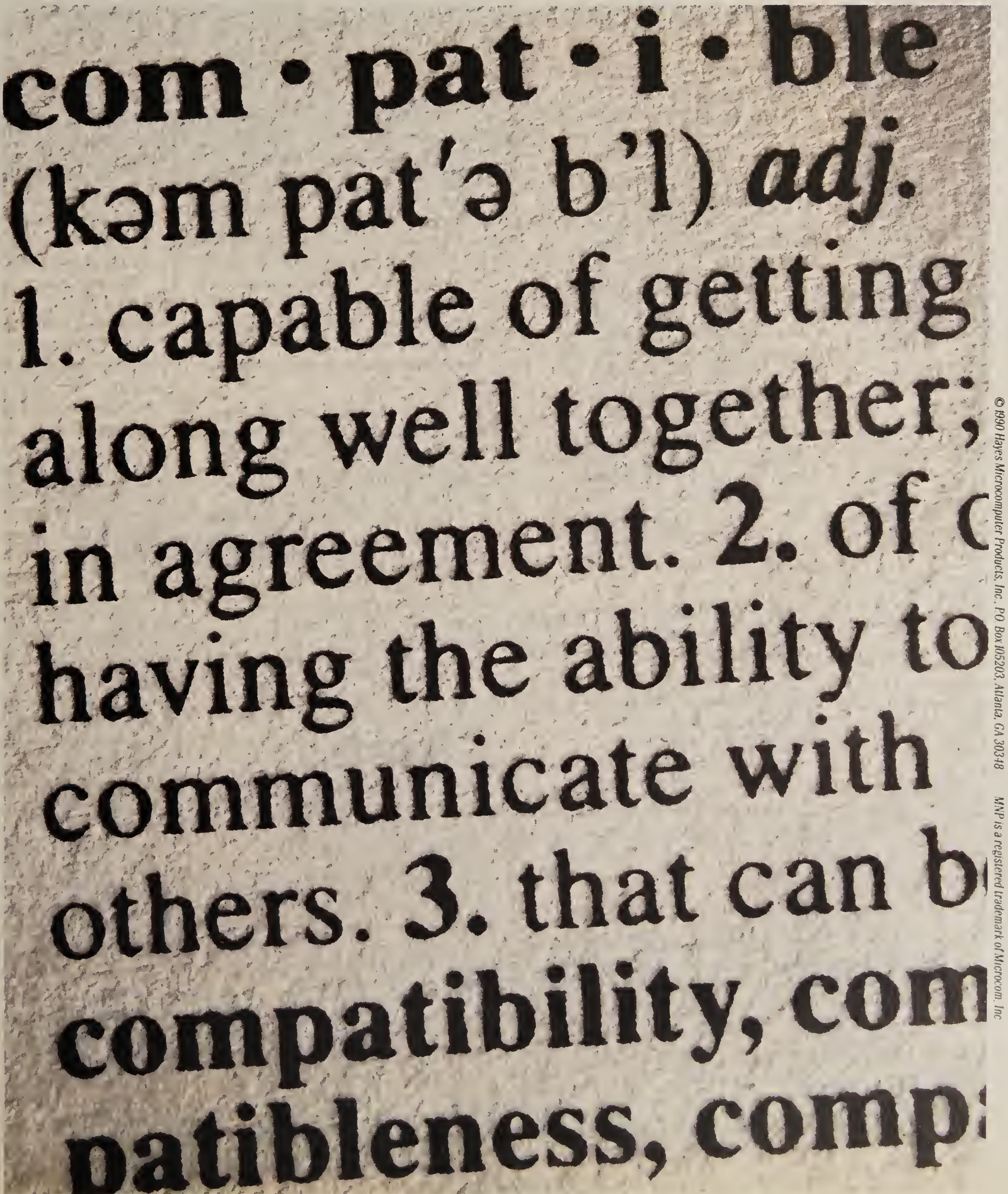

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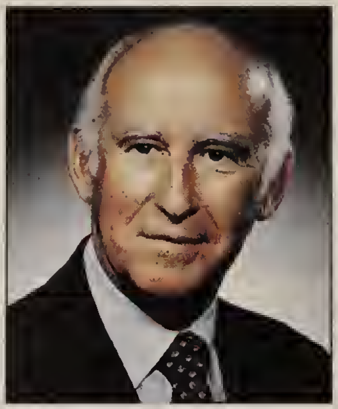
Guilbert and EDI: From postwar Berlin to the present

Today's users of EDI — a group that numbers between 8,000 and 11,000, according to Stamford, Conn.-based Gartner Group, Inc. — have 70-year-old Ed Guilbert to thank both for conceiving the basic technology and for introducing EDI standards.

While serving as U.S. traffic director of the Berlin Airlift from 1948 to 1949, Guilbert realized that the paper-based communication system used to order emergency supplies from the U.S. and the UK slowed down vital shipments to war-torn Berlin. As an emergency solution, he started communicating via telex.

Building on the concept of automating transactions, Guilbert installed some of the first EDI links among military computers around the world. When he founded the Transportation Data Coordinating Committee (TDCC)-Electronic Data Interchange Association (EDIA) in 1969, he began to standardize the disparate messaging forms threatening to inhibit the technology.

The concept proved durable; today's American National Standards Institute X12 standard is based on the original architecture nailed down by the Guilbert-run TDCC-EDIA in 1975.



Guilbert reacted *to airlift emergency*

For some people, inventing and standardizing the EDI field and 19 years of service as the head of TDCC-EDIA might be enough, but not for Guilbert. Now, as president of Guilbert Associates, Inc. in Washington, D.C., he is still enthusiastically seeking new applications for EDI. He is exploring ways to merge EDI with imaging technology. Why? Because most firms using EDI are only automating about 10% of their paperwork with it, and EDI has much more to offer firms that do a lot of their business on paper, he said.

JOANIE M. WEXLER

Why Experienced Computer Users Don't Think Very Much About Modems

Our research shows that knowledgeable MIS managers, PC coordinators, and end users simply don't want to think of modems at all.

Not exactly what modem makers relish hearing! But it's hardly surprising that you want to save your thinking for bigger and more important things.

Modems are a lot like plumbing. As long as the data is flowing, they're practically invisible. However, when something goes wrong, those little boxes are just lavished with attention.

By then, you've lost data, time, money, and perhaps an opportunity. Both senders and receivers are dismayed and disarrayed.

Fortunately, there are simple ways to limit this aggravation. Our research suggests a few points to keep in mind.

The cost of the modem is not the modem's cost.

The fixed price of the modem is relatively insignificant. Ongoing costs matter far more.

In the long run, for example, a high-speed modem can save you a small fortune on phone bills. More data sent in less time means less money to the phone company.

You can also save with more reliable and robust modems that communicate over a wide range of telephone line conditions.

Resending data costs both time and money. The less time you spend transmitting data, the more time you have to spend on your business.

Downtime and adaptation time can also cost you dearly.

Be sure to ask if the modems are compatible with their earlier generations. You don't want to start with suppliers who regularly obsolete their own products, or who don't offer you an upgrade path.

Modem support can be a real hassle with the wrong vendor.

Setting up and installing your modem can affect both your budget and your sanity. Many manufacturers forget to make their modems easy to use!

This becomes expensive when you want to start up fast or need to support a large number of users.

Dip switches, on-line help screens, and easy-to-use manuals should be demanded. It also helps to have a quick-reference guide printed on the bottom of the case.

In sticky situations, it's vital to have toll-free support and applications engineering.

Bottom line: The data must get through.

A bit of data traveling from your computer is converted by your modem and sent to your local telephone office.

From there, it is exposed to the vagaries of phone lines, various transmission media, and weather patterns.

They all conspire to corrupt your data and slow down your throughput.

All modems are not created equal; some are less sensitive to noise and have better error-correcting protocols.

Some are simply more robust and have better filters.

Modems are more than mere commodities — technology does count.

"When things go wrong, I want the supplier there."

That's when you need the *right* supplier on board. Look for one who gives fast turnaround time on repairs and adjustments, and who doesn't vanish after the sale.

Look for a company with history and promise — one that's here today and here tomorrow.

Not everyone needs the same modem.

The best way to keep modems from wasting your time and money is to buy them from a reliable supplier with a broad product line. Those with limited lines sometimes try to cram square pegs into round holes.

People with differing applications have differing requirements. Dealing with a broad-line supplier simplifies ordering, reduces training/support time and cost, and limits hassle and coordination.

In the end, if you give enough consideration to choosing the right supplier, you'll hardly have to give modems any thought at all.

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CPWD4/9/90

Matches

CONTINUED FROM PAGE 85

ling technology, despite the fact that the first standards-based transaction took place in 1975, according to Ed Guilbert, president of Ed Guilbert Associates, Inc. (see story above). In addition, Sears, Roebuck and Co. was using a proprietary form of EDI as far back as 20 years ago.

Industry analysts suggested that EDI has taken a while to kick in because it represents a major change in the way companies have been doing business for years.

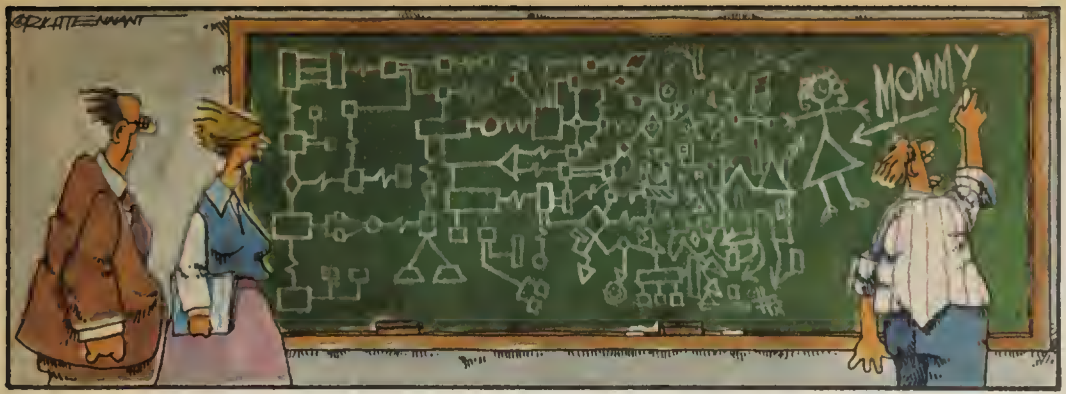
"Companies need both a psychological and financial impetus to change old habits," Wheatman noted. "Your payback with EDI is two to three years, so your motivation somewhat depends on how you count your payback and what kind of company you are."

Steve Gaal, a partner in the venture capital firm T.A. Associates in Boston, noted that while the EDI market is growing at "30% to 50% per year," he has had trouble finding an EDI investment opportunity. "We can't find companies with big enough ideas for EDI," he said. He described EDI as the "thin edge of the wedge," in that as it is currently being used, it handles "only a tiny bit of the data that gets transmitted around."

Marino Polestra, an associate in the Boston office of venture capital firm Burr, Egan, Deleage & Co., concurred. "EDI may not be a market in and of itself but rather part of a bigger market. It may end up the technical extension of applications and network services — the 'glue,' if you will. But it's not clear that you can be a 'glue' vendor."

The president of an EDI research firm in Oak Park, Ill., said he sees a big opportunity for interfacing EDI with electronic mail and facsimile. "We're continually seeing more bypass of the postal system," said Daniel Ferguson, who heads EDI Research, Inc. "AT&T has a very good fax service and is looking at enhancing it. I believe they could marry their EDI, fax and E-mail services very easily."

Another opportunity, Ferguson said, lies in bank-provided document translation services, in which the originator uses EDI to send documents and the bank transmits them in whatever form the receiver wants. According to Ferguson, such services are already emerging at First Chicago, National Bank of Detroit and Harris Bank. In a variation on the theme, he added, other banks and value-added network service providers, such as Security Pacific Corp. and BT Tymnet, are starting to partner.



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   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Mgrs., Suprv. of Programming, Software Dev
   - 32. Programmers, Software Developers
   - 60. Sys. Integrators/VARs/Consulting Mgt

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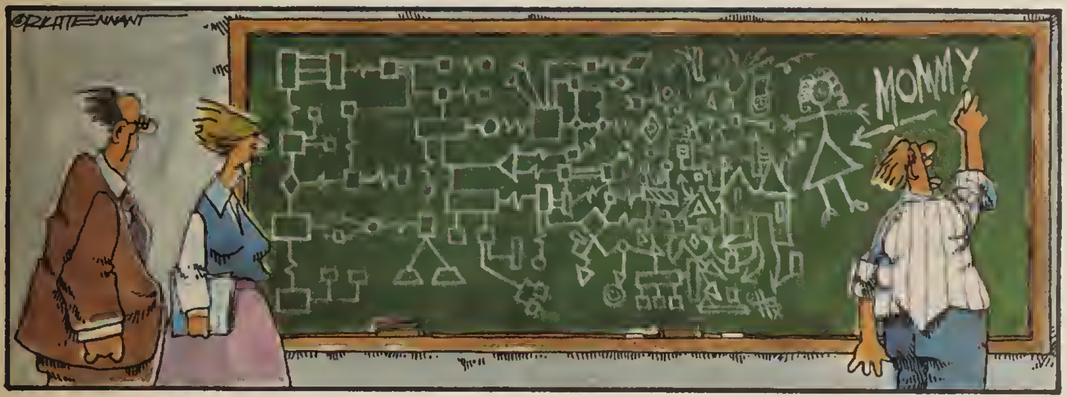

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INDUSTRY INSIGHT

Nell Margolis

The Oracle of Belmont

What can the computer industry learn from Oracle Systems's recent slip from Wall Street grace?

Harrison Tyler (not his real name), who has spent the past decade following technology stocks, believes that there are important lessons to be learned. He also believes that few, if any, will learn them.

These are two of the three things that Tyler told me, fresh from the teleconference that Oracle held to try to explain to analysts why its year-to-year quarterly earnings, heretofore charted only in the stratosphere, were going to weigh in at a hefty 1% for third-quarter 1990.

The third thing he told me was to be sure not to use his real name. One need not wonder why. For starters, according to tales in circulation on the industry grapevine, the Oracle of Delphi had nothing on the Oracle of Belmont in the wrath and retribution department.

The lessons, Tyler said, are clear and compelling:

- What goes up must come down.
- The smaller a company, the easier it is to log three-digit annual growth rate.
- Deep doo-doo happens; that's why "saving for a rainy day" is a cliche.
- It doesn't always happen to the other guy; that's why saving for a rainy day isn't a bad idea . . .

Since most of us learned these precepts at our mothers' knees, Tyler said, you might think they could go without saying by now. But you'd be wrong.

"You'd suppose that after 22 years, software firms would have picked up some clues from history," he said, "but each one in its turn seems to think it's going to be the exception to every rule. The next question for Oracle is, do they seriously believe they can take their growth rate back to where it was before?" An astute — albeit cynical — student of computer industry history himself, he answered his own question: "It wouldn't surprise me if they do . . ."

The great American philosopher George Santayana, drawing on Euripides and Thucydides, said, "Those who cannot remember the past are condemned to repeat it."

The great industrialist Henry Ford made it clear that real businessfolk don't believe in Santayana. "History," he said, "is more or less bunk."

So far, the great software magnate Lawrence Ellison appears to be leaning toward Ford. However, Tyler and many others of his ilk agreed last week that Oracle Chief Executive Officer Ellison and his firm now have a splendid chance to pursue a credible growth strategy, grounded in software market history and an awareness of current computer industry, as well as U.S. and worldwide competitive and economic realities.

If they do, Tyler said, their investors, as well as their customers, are likely to cheer them on. Ellison's claims that Oracle will rise again next quarter, Tyler noted, failed to stop investors from bailing out in droves. "Maybe the message that Wall Street was trying to send him," he said, "is don't be so arrogant and blind."

Margolis is *Computerworld's* senior editor, industry.

INTERNATIONAL

BRIEFS

Taiwan on

An investment group led by Taiwan-based ADI Corp. announced plans last week to acquire 100% control of Esprit Systems, Inc., taking private the San Jose, Calif.-based connectivity products supplier to the value-added resellers. The would-be buyers, who among them already hold 91% of Esprit's outstanding common stock, are offering to buy out the remaining 9% owners at 17 cents per share.

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One attendee at Cebit '90, the computer trade fair held late last month in Hannover, West Germany, got carried away with the attractions of the Triton 88 computer offered by Oslo-based Dolphin Server Technology. On the last day of the fair, he apparently walked up to the firm's booth, grabbed the Triton CPU and fled into the crowd.

....

The deal Israeli done

The U.S. subsidiary of Haifa, Israel-based I.I.S. Intelligent Information Systems Ltd. last week completed its approximately $8.4 million acquisition of Lee Data Corp.'s commercial and international IBM 3270 plug-compatible peripherals and service business.

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CW

Myth of the elite programmer

Specialists in C may get the publicity, but Cobol experts still get the jobs

BY JANET RUHL
SPECIAL TO CW

If you leaf through programmers' magazines or come across promotions oriented toward programmers, you may wonder if all of them work in C on personal computers.

The magazines for PCs love to describe mainframe languages and software as dinosaurs hovering on the brink of extinction. If you have built your career on working with them, you may wonder if the ascendance of C means your career is also headed for extinction unless you jump on the C bandwagon.

Well, relax. In spite of the flood of ink devoted to C, the job outlook for C programmers is very similar to the outlook for programmers in general. The demand and the salaries for people experienced in mainframe Cobol still tend to exceed the levels for C experts.

C's glamorous reputation began several years ago during the PC software boom. New hires out of college who could code in C and Intel Corp.'s assembler were pulling down starting salaries of $50,000 or more. Ray Turner, manager of recruiting firm Source EDP's Hartford, Conn., office, recalls one 19-year-old C programmer who started at a PC software vendor for $70,000 per year.

Turner hastens to add that those days are largely gone. In his market, starting salaries for C programmers fresh out of school — usually computer science graduates with an engineering background — are only a little higher than pay for beginning Cobol programmers, in the range of $28,000 to $30,000. After a few years, this difference shrinks or disappears. With three to five years of experience, C programmers tend to reach the $40,000 range — not significantly different than the salary of an aggressive mainframe programmer with good skills.

The salary outlook is similar in other parts of the country, including such centers of C as Silicon Valley and Seattle. Dale Stephens, a principal at Northwest Professional Services, a Seattle-area recruiting firm, says salaries there for experienced C people who know Intel assembler programming fall in a range of $35,000 to $40,000.

Seattle's fame as a center for PC programming has worked to lower salaries. Stephens says the reputation has attracted a flood of programmers, causing competition for jobs so fierce that some qualified people can't find programming work at all.

The demand for C people in the Chicago area is strong, according to Marcos Ramos, an information systems specialist at the Oak Brook, Ill., office of recruiter Robert Half International. Ramos says he gets as many job orders for C programmers as for mainframe specialists. Most of this demand is from consulting firms that want to offer their clients skills that are rare in the region. Some of it is from companies implementing local-area network-based systems.

Most of these employers, however, pay experienced C programmers relatively low salaries — in the neighborhood of $30,000. In contrast, Cobol programmers with equivalent experience who work with MVS and CICS earn up to $40,000, Ramos says. He also points out that mainframe programming jobs at established companies tend to be more stable than the C programming jobs he sees.

The few C programmers who have struck it truly rich are the ones whose deals included options to buy stock that rose astronomically in price. "The higher the risk, the higher the dollars," Turner says. He adds that some software start-ups still offer C programmers $75,000 per year, but the precarious nature of such businesses often means the programmer loses the job after a couple of months.

THE ACTUAL NUMBER of C people needed by industry may remain relatively small.

In spite of the media focus on the PC platform, much of the demand for C programmers is for people with a Unix background. In Silicon Valley, 75% of the call for C programmers is for people with experience using Unix-based C rather than DOS or OS/2 versions, according to Dave Flansbaum, Source EDP's managing director for Northern California. The greatest demand and highest salaries in Silicon Valley are for C programmers experienced with the Unix kernel or complex applications in areas like medical instrumentation.

In Connecticut, most of the demand for C programmers that Turner sees is for people experienced in scientific and engineering applications — again, mostly on a Unix platform.

Recruiters agree that there is — and will continue to be — a growing demand for C programmers who have mastered the graphical environments of Microsoft Corp.'s Windows and OS/2 Presentation Manager. However, home-based PC enthusiasts who have written C programs for their own use are emphatically not in demand, says Ramos, who hears from such people frequently. Employers want people with business experience who are familiar with the rigorous demands of commercial applications and specialized C function libraries.

While demand for experienced C programmers is growing and is likely to continue doing so, the actual number of C people needed by industry may remain relatively small. Turner estimates that he gets 100 job orders for mainframe programmers for every one he receives for a C programmer. One company he works with that has been described in the press as aggressively pursuing PC technologies has a mere six job openings for C programmers compared with 250 for MVS Cobol people.

In addition, most high-profile software companies employ far fewer programmers than low-profile IS organizations dominated by Cobol applications. Marcia Barthelmi, a recruiter at Borland International, says that the company — a vendor of numerous major PC applications and a best-selling C compiler — employs only about 100 programmers.

Ruhl is a consultant and programmer in Connecticut and author of *The Programmer's Survival Guide: Career Strategies for Computer Professionals.*

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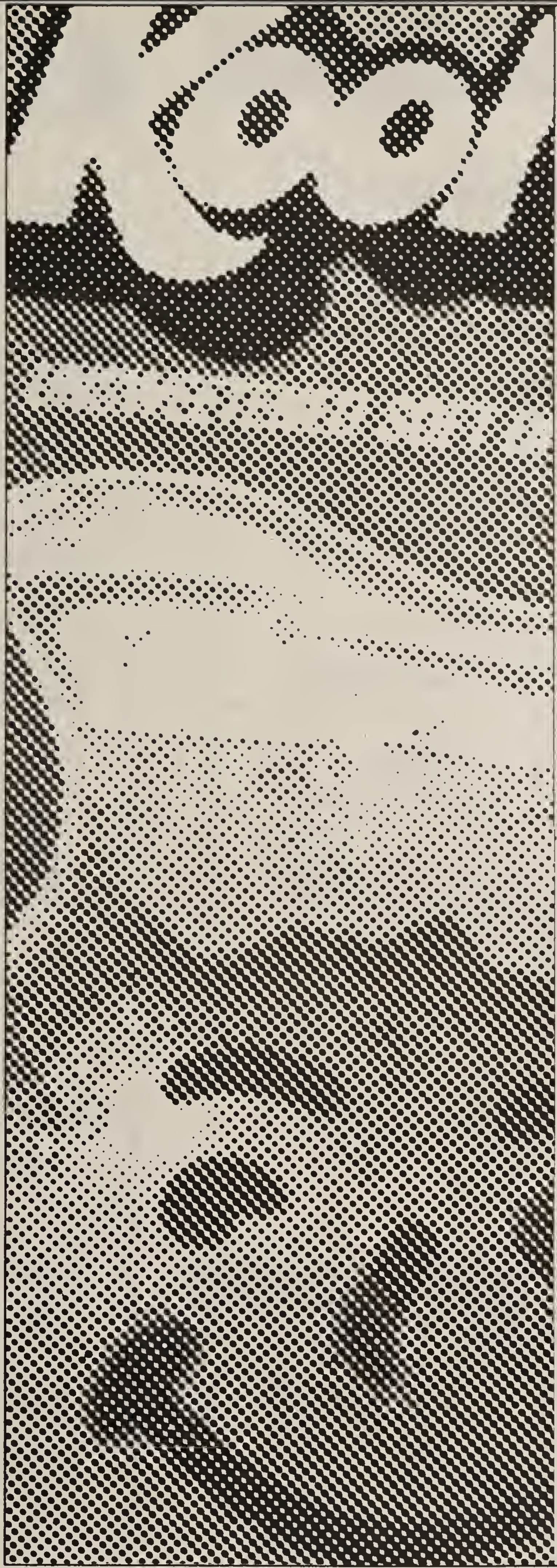

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You will provide operating system management and technical support for our Computer Center systems. Specifically, you will be responsible for maintaining and optimizing the performance of computer hardware; software and our Division LAN; providing technical support and training to systems users and developing, maintaining and supporting software application programs.

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Allen Bradley, long a leader in industrial controls, is now moving to the forefront in LAN communication systems as well. The Communication Division is located in Ann Arbor, Michigan, where recreational, cultural and educational offerings create an excellent environment in which to live and raise a family. If you have the skills and commitment to quality to make the move with us, send your resume, including salary history and requirements (required for consideration), to: **Donna Gundle-Krieg, Human Resources, Allen-Bradley Communication Division, 555 Briarwood Circle, Ann Arbor, MI 48108.** An Equal Opportunity Employer M/F. NO PHONE CALLS PLEASE.

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REQUIREMENTS: MSCS with two years experience, of which at least one year is industrial experience and at most one year is academic experience that includes extensive project work, as follows: two years software design experience in each of the following disciplines: programming in the C language, programming in the Unix (both BSD 4.3 and System V) and MS DOS operating systems; developing user interface and computer graphics applications. One year industrial software design experience in each of the following: object-oriented software design; programming in the C++ language; designing applications using X windows, Motif, ET++, InterViews, and MS Windows libraries; and developing database management systems. One year industrial experience using electronic CAE systems and test equipment; linking design data and tools to manufacturing test; and creating and editing analog and digital data. One year industrial experience providing applications engineering support to software product customers. Excellent written and verbal communication skills, as demonstrated by written project specifications, written project plans and/or summary/status reports. Ability to both work well within project teams and also lead small teams to realization of common project goals, as demonstrated by successful completion of a software project as a member of an engineering project team. Experience may be gained concurrently.

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Senior Software Signal Processing Engineer to design, analyze, implement, test and develop key Image/Signal Processing algorithms for a computer systems environment. Develop computer graphics software for display systems and design software tools for processing images/signals. Develop and implement algorithms in digital halftoning, character recognition, pattern recognition and image quantization. Integrate software implementations of such algorithms with existing system software products to facilitate the use of images in an office environment. Program in C, FORTRAN, PASCAL and in assembly level language in a VMS and UNIX environment. Extend existing products in the area by researching, developing and transferring image algorithm technology from Advanced Development to Product Development. Requirements are: Master of Science in Electrical Engineering or Computer Science with knowledge of digital signal processing, image processing, stochastic processes, systems analysis, numerical analysis, signal analysis, pattern recognition, character recognition, computer graphics, with a background in computer systems software and algorithmic development required; programming in C, FORTRAN, PASCAL and assembly level languages; demonstrated ability with VMS and UNIX. 40hr/wk 8:15 - 5:00 p.m. Salary: $39,000 - 42,000 per year. If you are interested in, and qualified for the above position, please forward your resume in duplicate to: Attention: Job Order #00365, Department of Employment and Training, Government Center, 19 Staniford Street, Boston, MA 02114.

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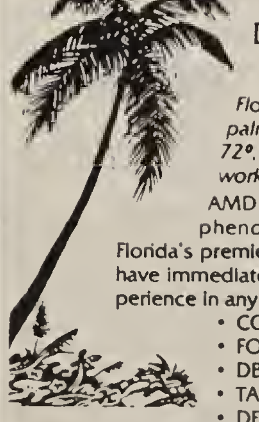

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MARKETPLACE

The anxiety of the on-line user

Choosing electronic data services means getting in the users' shoes

BY RAYMOND T. NIMMER
SPECIAL TO CW

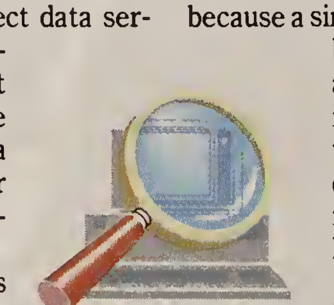
Companies today are facing an information crisis. They must use information more effectively, but they confront a growing volume of data that they find increasingly difficult to digest — that is, to convert to useable information.

One front on which information systems people face this crisis is in choosing and managing external electronic data services for their company. There are several hundred commercial services and thousands of electronic bulletin boards available. No one can use all of them or all of the data that any one of them contains.

This is the kind of crisis Richard Wurman describes in his 1989 book *Information Anxiety* — the gap between what we understand and what we think we should understand. Imagine, for example, that I tell you I need your advice on my tax liability and that I will bring you all the "information" you need to help me. Then I leave you with 14 boxes of unorganized receipts, reports and memos.

This kind of situation creates anxiety. Users of electronic data face this anxiety unless they have a workable and obvious structure to access the data that surrounds them.

Because information science has traditionally dealt with the transfer and storage of data, some managers select data services with the anachronistic view that they need only make them available in a systematic manner to fulfill their responsibility.



This notion is wrong; there is no single systematic way to make data available or to induce decision-makers to use data services. The first rule in selecting one is to base decisions on discussions with the people who will use the data. It's not sufficient to speak with the suppliers of the data or in-house technologists or, in many cases, only the people who manage the users.

In discussing data services with users, it is critical to consider how much effort they are willing to make to access one. The unopened book communicates nothing; the value of any data service depends on its ability to induce the user to "open the book" and, having done so, find relevant data.

Several weeks ago I attended a meeting at which I discussed whether the bar association in my state should develop an electronic bulletin board for lawyers. We were discussing the question because a similar system created by the national bar association was failing; its access routine was too complicated for non-technical people such as lawyers to use.

Along with keeping lawyers from getting in, the difficulty of using the national bar association's service led some of my colleagues to believe the service would offer them little of value even if they did gain access to it.

This kind of reluctance or inability to use technology cannot always be resolved through training. Problems with access sometimes go beyond issues of mechanics. You need to choose a system that induces people to use it.

Another service illustrates the possibilities. West Publishing Co. recently gave all law school faculty free access to its Westlaw electronic database. For each user, members of West's technical staff program communications software according to information the individual sends to the company. The program operates automatically, making the communication technology invisible to the user. West provided true access instead of just making data available.

Another issue in choosing data services is how users can search them. Assuming I have opened the book, how do I find what is relevant to me? Even more than the first question, this one calls for understanding human behavior. What thought processes will the users pursue? What thought processes do we wish to encourage?

In some cases, we want structure and content defined from above. We might want data accessible by the day, week, month or year if users should focus on current performance or examine trends over time. Alternatively, field offices might need to access demographic data according to location because the company manages marketing on the basis of locale. The structure must reflect how people plan to use the electronic information.

If the objective is to promote unstructured and intuitive planning through an executive information system, it may be ineffective to incorporate services with a rigid query system that cannot be varied. An open-ended structure could be more effective, even if it makes it more difficult for an executive to find something such as a competitor's security filing. One strength of human thought lies in our ability to make connections that are not entirely logical.

Finally, of course, we need to know how users can retrieve information. Does a service allow them to download? If so, can they download the data in a manageable form? If not, are they willing to read it from the screen?

Selecting data services and presenting them to the user is not simply a matter of assessing their content and assuring that there is a technically apt method of access. The data service is an essential ingredient of the analysis and decision-making that it supports. It is on the basis of that process that managers must make choices.

Nimmer is foundation professor of law at the University of Houston and counsel to the law firm of Sheinfeld, Maley & Kay.

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Closing prices report for the week ending March 30, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$500	$595	$400
XT Model 086	$600	$825	$600
XT Model 089	$675	$800	$600
AT Model 099	$1,050	$1,600	$1,000
AT Model 239	$1,350	$1,700	$1,200
AT Model 339	$1,500	$1,800	$1,500
PS/2 Model 50	$1,850	$2,200	$1,700
PS/2 Model 60	$2,425	$2,600	$2,400
Compaq Portable II	$1,700	$1,725	$1,550
Portable III	$2,300	$2,500	$1,900
Portable 286	$1,700	$2,000	$1,700
Plus	$750	$950	$675
Deskpro	$900	$1,200	$800
Deskpro 286	$1,500	$1,825	$1,300
Deskpro 386/16	$2,500	$2,750	$2,475
Apple Macintosh 512	$550	$750	$525
512E	$600	$890	$550
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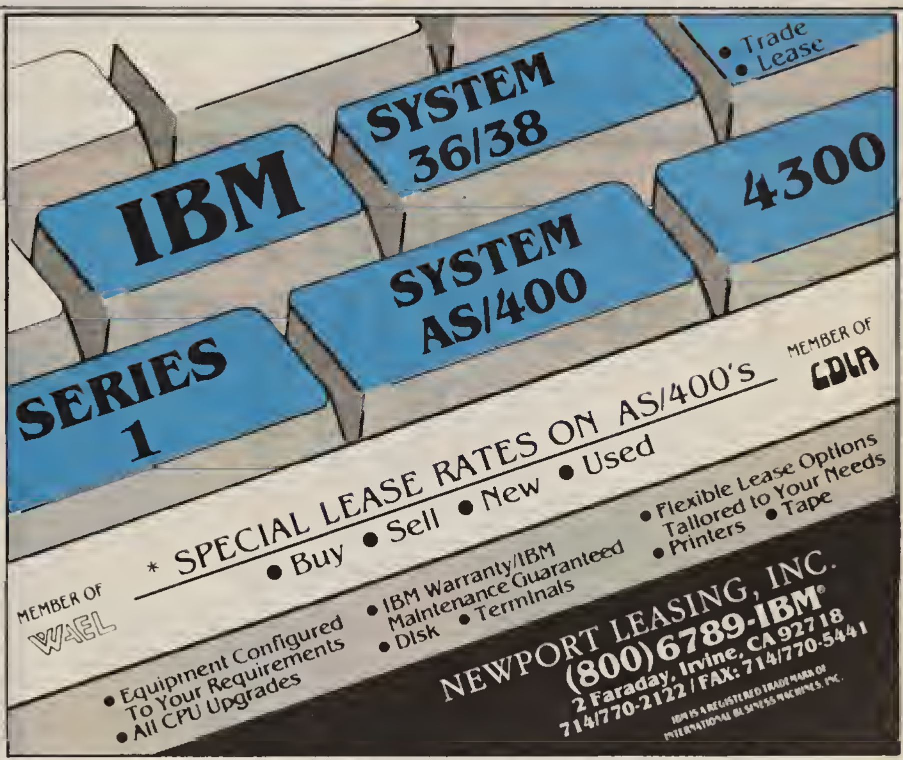

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Request for Proposal No. 1770, due Wednesday, April 25, 1990 at 3:30 p.m. for the acquisition of a new or used IBM mainframe and related system software to work in conjunction with an existing IBM 4381 processor for the Computer Center at the UNIVERSITY OF MISSISSIPPI MEDICAL CENTER.

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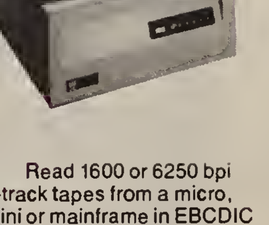

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Training in your own backyard

Techniques don't have to be costly and could be right under your nose

BY AVERY CLOUD
SPECIAL TO CW

Effective training is one of the greatest boons to the productivity and morale of information systems organizations. Unfortunately, budget constraints often lead to benign neglect of training needs, resulting in a waste of potential human resources.

Training does not have to be expensive or elaborate, however. By adopting a few simple practices, IS organizations can redouble the effectiveness of their training efforts.

One inexpensive and potentially far-reaching step is to perform what I call a SWIN analysis. SWIN is an acronym — yes, another one — that stands for strengths, weaknesses, interests and needs.

To conduct a SWIN analysis, create a training worksheet for each employee. On each sheet, list the four SWIN characteristics for the employee. Next, create a worksheet for the department listing its strengths, weaknesses, interests and needs. The worksheet should indicate whether the department possesses the skills to effectively execute company plans and respond to business needs.

The final step is to compare the department's characteristics with the ones for employees to size up their compatibility. This analysis will let you determine which employee weaknesses should be addressed through training to relieve departmental weaknesses.

The analysis will also uncover conflicts between employee interests and departmental needs. It will prevent you from providing training in areas where the return would be low. Finally, if hiring is required to relieve departmental weaknesses, it will arm you with the information required to argue the case.

In providing training, some of the best opportunities are available right in the IS organization — your own backyard. You should exploit them fully before spending money on outside training.

To begin with, practice strategic hiring. Whenever there is an opportunity to hire new people, recruit someone who brings a skill or knowledge that is important to current or future endeavors. Also, try to make sure the new person can and will teach others. This tactic can make a tremendous difference to organizations managing a conversion.

Give new employees an orientation manual that describes the procedures and day-to-day operations of the department. Anticipate questions that a new person might have and provide the answers in the manual.

Assign new employees to tasks at which they are already proficient. This practice will help them gain the confidence needed to tackle new challenges. It will also help them feel like contributing members of the department quickly. This kind of positive attitude enhances learning.

Supply all employees with a written copy of their job description and descriptions of positions to which they might aspire. That information will give the employees a better idea of what they need to learn to do their current work and to move up.

In assigning people to projects, team up an inexperienced employee with a more seasoned colleague. Give the inexperienced person primary responsibility to encourage greater effort. Make sure the experienced person knows that he or she is in a consulting role.

Create situations in which staff members have to teach what they have learned. Teaching is one of the best ways to reinforce and refine knowledge and understanding. You can create such situations by asking the individual to write articles, give presentations or help train a newcomer.

Reward information sharing in the department. Make it beneficial for people to teach each other what they know. You will get the behavior that you reward, so make sure you reward sharing rather than hoarding of knowledge.

Set aside a few hours per week for employees to spend in self-development activities such as reading or experimenting with new software or hardware. Purchase good desk references and self-help literature for each person. Route professional publications past employees' desks.

A required reading list would help, too. Include manuals that the technical people should become familiar with. Selectively assign individuals to tasks that complement their classes and reading.

Provide staff members with a telephone list of other employees whom they might need to contact. Include home telephone numbers where appropriate and describe each person's responsibilities. Knowing whom to reach to solve problems and how to do so is key for employees, so why not speed up the process?

In the case of programmers, provide each one with a tool kit — a data set with the most frequently used utilities, sample programs and documentation.

With this kind of creative approach to training, the IS organization will get the most from its human resources, and the company will get a higher return on its investments in systems and people.

Cloud is manager of technical services in the information services department at Bowman Gray/Baptist Hospital in Winston-Salem, N.C.

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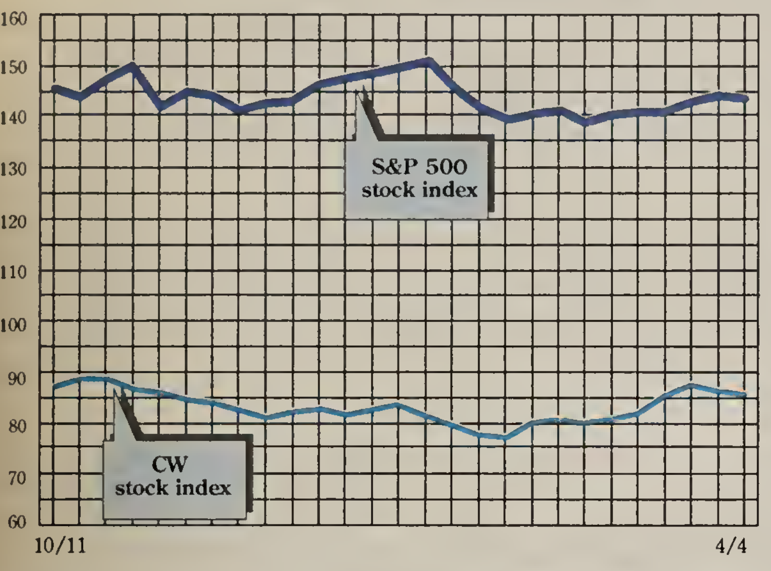

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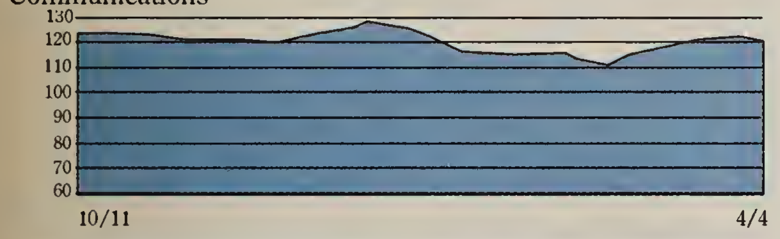
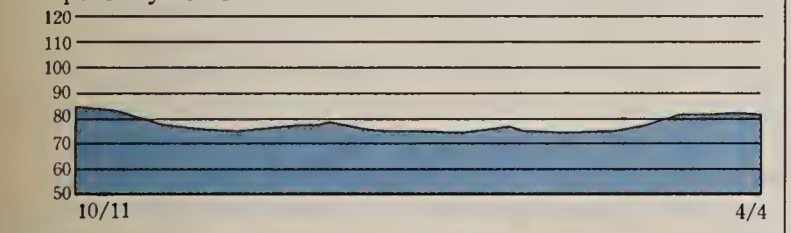
Communications



Computer Systems



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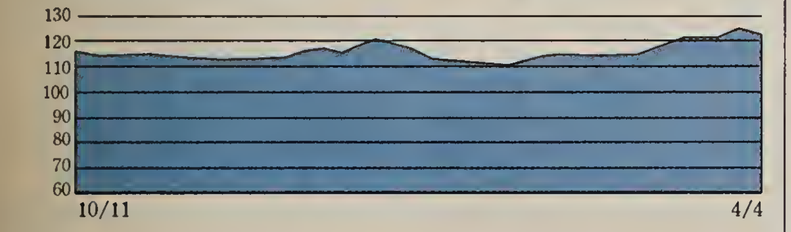
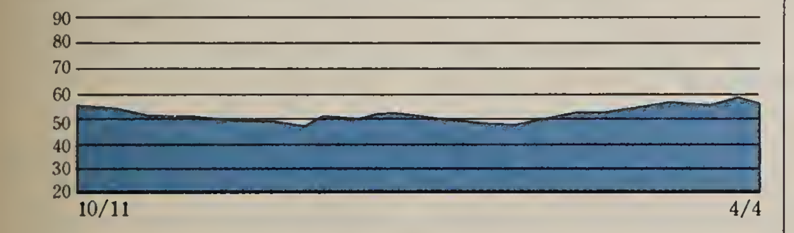


Semiconductors



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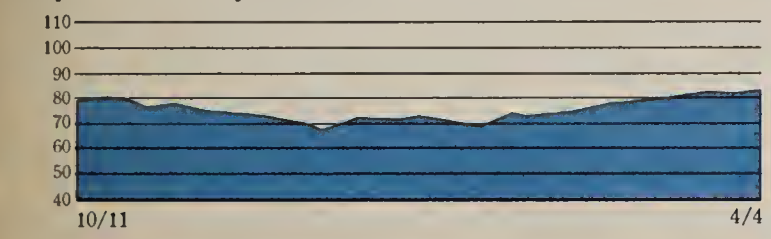
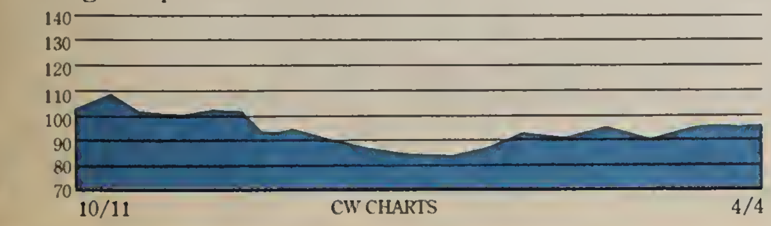


Leasing Companies



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, APRIL 4, 1990

Communications and Network Services

EXCH		PRICE				
		52-WEEK RANGE		CLOSE APRIL 4, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	68	50	60.25	0.1	0.2
Q	ANDREW CORP	26	18	23.75	-0.8	-3.1
Q	ARTEL COMM CORP	10	3	8.5	0.1	1.5
N	AT&T	47	31	41.25	-1.6	-3.8
Q	AVANTEK INC	7	2	3	0.0	0.0
N	AYDIN CORP	21	14	14.75	-0.9	-5.6
N	BELL ATLANTIC CORP	114	75	95	1.5	1.6
N	BELLSOUTH CORP	59	41	54.875	0.0	0.0
Q	COMPRESSION LABS INC	15	5	12.75	-1.4	-9.7
Q	CONTEL CORP	37	25	28.5	-0.1	-0.4
Q	DATA SWITCH CORP	6	2	2	-0.6	-23.8
Q	DIGITAL COMM ASSOC	25	17	21.875	1.4	6.7
Q	DYNATECH CORP	21	15	15.25	-1.0	-6.2
Q	FIBRONICS INTNL INC	8	4	7.5	0.3	3.4
Q	GANDALF TECHNOLOGIES	7	3	2.75	0.0	0.0
N	GENERAL DATACOMM INDS	7	4	4	-0.1	-3.0
N	GTE CORP	72	45	65.625	1.1	1.7
Q	INFOTRON SYS CORP	13	5	5.5	0.3	4.8
N	ITT CORP	65	52	53.125	-0.1	-0.2
N	M A COM INC	9	4	4	-0.3	-5.9
Q	MCI COMMUNICATIONS CORP	49	29	37.125	-0.3	-0.7
N	NETWORK EQUIP TECH INC	34	20	22	-7.8	-26.1
Q	NETWORK SYS CORP	13	7	11.625	0.6	5.7
N	NORTHERN TELECOM LTD	26	14	25.125	0.1	0.5
Q	NOVELL INC	45	24	44	1.9	4.5
N	NYNEX CORP	92	71	82	0.4	0.5
N	PACIFIC TELESIS GROUP	52	35	45.25	-1.1	-2.4
A	PENRIL CORP	9	4	7	-0.4	-5.1
N	SCIENTIFIC ATLANTA INC	25	14	23.125	0.6	2.8
N	SOUTHWESTERN BELL CORP	65	44	56.25	-0.1	-0.2
Q	3 COM CORP	29	10	13.125	0.1	1.0
N	U S WEST INC	81	61	75.5	1.3	1.7

Computer Systems

Q	ALLIANT COMPUTER SYS	8	3	7	0.8	12.0
Q	ALPHA MICROSYSTEMS	8	4	3.625	-0.1	-3.3
Q	ALTOS COMPUTER SYS	8	5	6.375	0.5	8.5
A	AMDAHL CORP	23	11	14.875	-0.1	-0.8
Q	APPLE COMPUTER INC	50	32	41.25	0.0	0.0
N	BOLT BERANEK & NEWMAN	10	5	6	-0.5	-7.7
N	COMPAQ COMPUTER CORP	113	69	99.625	4.3	4.5
N	COMMODORE INTNL	20	7	8.25	-0.1	-1.5
N	CONTROL DATA CORP	24	16	20.25	0.3	1.3
N	CRAY RESH INC	58	31	48.875	0.3	0.5
Q	DAISY SYS CORP	5	0	0.531	0.0	-5.7
N	DATA GEN CORP	19	8	9	-0.1	-1.4
N	DATAPOINT CORP	6	2	2.75	-0.6	-18.5
Q	DELL COMPUTER CORP	9	5	7.875	0.3	3.3
N	DIGITAL EQUIP CORP	103	70	79.25	0.8	1.0
N	FLOATING POINT SYS INC	4	1	1.25	-0.1	-9.1
N	HARRIS CORP	40	28	33.125	-0.9	-2.6
N	HEWLETT PACKARD CO	58	40	45.625	-1.0	-2.1
N	HONEYWELL INC	92	67	89	0.9	1.0
N	IBM	119	93	106.5	0.6	0.6
Q	INFORMATION INTL INC	16	12	12	-0.4	-3.0
Q	IPL SYS INC	11	5	10.25	0.3	2.5
N	MAI BASIC FOUR INC	9	2	3.125	0.3	8.7
N	MATSUSHITA ELEC INDL LTD	185	123	136.625	-0.4	-0.3
Q	MENTOR GRAPHICS CORP	22	14	19.125	0.4	2.0
N	NBI INC	3	0	0.281	0.0	0.0
N	NCR CORP	72	53	70	0.1	0.2
Q	PYRAMID TECHNOLOGY	30	9	29.75	1.1	3.9
Q	SEQUENT COMP SYS INC	28	11	24.25	-2.0	-7.6
Q	SHAREBASE CORP	3	0	0.438	0.0	0.0
Q	SUN MICROSYSTEM INC	25	13	23.375	0.0	0.0
Q	SYMBOLICS INC	2	1	0.75	0.0	0.0
N	TANDEM COMPUTERS INC	30	15	27.25	-0.9	-3.1
N	TANDY CORP	49	32	33.75	0.5	1.5
N	ULTIMATE CORP	12	6	5.875	-0.5	-7.8
N	UNISYS CORP	28	12	15	-0.1	-0.8
A	WANG LABS INC	9	4	5.75	0.4	7.0

Software & DP Services

Q	AMERICAN MGMT SYS INC	17	11	13	0.0	0.0
Q	AMERICAN SOFTWARE INC	24	13	20	-1.9	-8.6
N	ANACOMP INC	8	3	2.75	-0.4	-12.0
Q	ANALYSTS INTL CORP	20	13	18	1.0	5.9
Q	ASHTON TATE	24	9	13.5	1.4	11.3
Q	ASK COMPUTER SYS INC	16	7	8.875	-0.5	-5.3
N	AUTO DATA PROCESSING	55	37	54	2.1	4.1
Q	AUTODESK INC	50	30	46.25	-1.3	-2.6
Q	BMC SOFTWARE INC	26	11	24.5	0.3	1.0
N	BUSINESSLAND INC	14	7	10.375	-1.0	-8.8
Q	COGNOS INC	8	4	5.375	-0.4	-6.5
N	COMPUTER ASSOC INTL INC	22	11	14	0.0	0.0
Q	COMPUTER HORIZONS CORP	11	7	8.5	0.3	3.0
N	COMPUTER SCIENCES CORP	59	44	43.75	-2.0	-4.4
N	COMPUTER TASK GROUP INC	15	9	10.75	0.1	1.2
Q	COMSHARE INC	44	26	40	-1.5	-3.6
Q	CORPORATE SOFTWARE	16	8	12	-0.3	-2.0
N	GENERAL MTRS (CLS E)	31	22	29.75	-0.5	-1.7
Q	HOGAN SYS INC	7	4	4.375	0.0	0.0
Q	INFORMIX CORP	17	8	12.5	-1.6	-11.5
Q	INTELLICORP INC	7	3	6	0.0	0.0
Q	LEGENT CORP	32	21	26.5	-1.8	-6.2
Q	LOTUS DEV CORP	38	19	36.5	1.3	3.5
Q	MICROSOFT CORP	119	48	117	6.0	5.4
Q	NATIONAL DATA CORP	35	23	24	-3.3	-11.9
N	ON LINE SOFTWARE INTL INC	11	6	8.75	-0.8	-7.9
Q	ORACLE SYS CORP	28	12	18.5	1.0	5.7
N	PANSOPHIC SYS INC	19	12	15.75	-1.3	-7.4
Q	PHOENIX TECHNOLOGIES INC	18	2	3	-0.1	-4.0
Q	POLICY MGMT SYS CORP	38	24	34.875	0.9	2.6
Q	PROGRAMMING & SYS INC	23	16	22.5	3.5	18.4
Q	RELATIONAL TECH INC	15	5	7.375	-1.9	-20.3
N	REYNOLDS & REYNOLDS CO	34	19	20.25	0.9	4.5
Q	SAGE SOFTWARE INC	13	7	12.625	-0.1	-1.0
Q	SEI CORP	20	15	17.75	-0.5	-2.7
Q	SHARED MED SYS CORP	19	12	13.125	-0.1	-0.9
Q	SOFTWARE PUBG CORP	25	12	22.75	0.8	3.4
Q	SUNGARD DATA SYS INC	26	13	20.5	1.5	7.9
Q	SYSTEMATICS INC	43	30	42.25	0.3	0.6
N	SYSTEM CENTER INC	26	18	22	-2.0	-8.3
N	SYS. SOFT INC	29	13	27.25	0.0	0.0
Q	WORDSTAR	3	1	1.063	-0.1	-5.5

Semiconductors

N	ADV MICRO DEVICES INC	11	7	9.125	-0.4	-3.9
N	ANALOG DEVICES INC	12	7	7.5	-0.6	-7.7
Q	ANALOGIC CORP	11	9	9.25	-0.1	-1.3
Q	CHIPS & TECHNOLOGIES INC	26	14	19.5	-0.3	-1.3
Q	INTEL CORP	44	25	42.5	0.0	0.0
Q	MICRON TECHNOLOGY INC	26	7	11.5	-1.1	-8.9
N	MOTOROLA INC	70	40	66.625	-0.5	-0.7
N	NATL SEMICONDUCTOR	9	5	7.625	-0.4	-4.7
N	TEXAS INSTRS INC	47	28	36	-1.4	-3.7
A	WESTERN DIGITAL CORP	15	6	11.75	-0.3	-2.1

Peripherals

Q	ALLOY COMP	3	1	1.375	0.0	0.0
N	AM INTL INC	6	3	2.875	-0.3	-8.0
Q	AST RESH INC	19	7	18.125	1.3	7.4
Q	AUTO TROL TECH CORP	6	2	2.75	0.2	7.3
Q	BANCTEC INC	20	11	18.25	0.5	2.8
Q	CIPHER DATA PRODS INC	10	4	8.125	0.0	0.0
A	COGNITRONICS CORP	8	3	5.625	0.3	4.7
Q	CONNER PERIPHERALS	21	7	20.125	1.4	7.3
A	DATAPRODUCTS CORP	18	5	6.375	0.3	4.1
A	DATARAM CORP	15	8	14.25	0.4	2.7
N	EASTMAN KODAK CO	52	37	40.25	1.1	2.9
N	E M C CORP MASS	7	3	6.125	0.1	2.1
Q	EMULEX CORP	12	5	5.5	-0.1	-2.2
Q	EVANS & SUTHERLAND	30	17	27.5	1.0	3.8
Q	ICOT CORP	3	1	1.5	-0.3	-14.3
Q	INTERLEAF INC	10	5	6	0.0	0.0
Q	IOMEGA CORP	4	2	4.25	0.4	11.5
Q	LEE DATA CORP	4	1	1.719	0.0	-1.8
Q	MASSTOR SYS CORP	4	1	1.75	-0.2	-9.7
Q	MAXTOR CORP	14	7	12.75	1.0	8.5
Q	MICROPOLIS CORP	8	3	4.625	0.0	0.0
N	MINNESOTA MNG & MFG CO	85	66	81.5	-2.1	-2.5
Q	PERSONAL COMP PRODUCTS INC	6	4	4.25	0.2	4.6
Q	PRINTRONIX INC	12	7	12.375	0.4	3.1
N	QMS INC	15	7	14.375	0.8	5.5
Q	QUANTUM CORP	17	5	13.875	0.5	3.7
N	RECOGNITION EQUIP INC	13	5	5.125	-0.1	-2.4
Q	REXON INC	9	6	8.875	0.0	0.0
Q	SEAGATE TECHNOLOGY	20	10	16.375	1.3	8.3
N	STORAGE TECH CORP	25	9	22.875	0.6	2.8
Q	TANDON CORP	2	0	1.438	-0.1	-4.1
N	TEKTRONIX INC	24	13	13.375	-0.1	-0.9
Q	TELEVIDEO SYS INC	1	0	0.25	0.0	0.0
N	XEROX CORP	69	50	55.75	-0.5	-0.9

Leasing Companies

Q	AMPLICON INC	115	8	9	-0.8	-7.7
N	CAPITAL ASSOC INTNL INC	9	3	3.75	0.1	1.7
N	COMDISCO INC	34	22	26.625	-0.6	-2.3
Q	CONTINENTAL INFO SYS	2	0	0.281	0.0	0.0
Q	LDI CORPORATION	18	13	16	0.3	1.6
Q	PHOENIX AMERN INC	5	3	3.375	0.1	3.8
Q	SELECTERM INC	9	6	5.875	0.0	0.0

EXCH: N — NEW YORK; A — AMERICAN; Q — NATIONAL

Feast or fast

Profits fatten up some firms; others tighten bottom-line belts

Investors served up the same fare last week as they did the week before: generally lackluster meat and potatoes with a couple of peppery entrees on the side.

Among the hot dishes was Digital Equipment Corp. After slicing and dicing prices on older machines and unveiling new workstations, DEC's stock gained 3 points to 79¾ by Thursday's close. No diet plate for Microsoft Corp., whose stock gained 3¾ points to 114½. Conner Peripherals inched up 1⅛ points to close at 19⅞.

The merger of Lotus Development Corp. and Novell, Inc. may prove fattening for stockholders, but both firms gained just 1 point, closing Thursday at 36¼ and 42⅞, respectively, before the announcement.

Network Equipment Technologies, Inc. (NET) looked leaner and meaner after losing 8¾ points to 21⅛. If misery loves company, NET and Tandem Computers, Inc. may become fast friends. Tandem slimmed down 5¼ to 22⅝.

Several technology issues went hungry last week. Staying even were IBM at 106⅛; Sun Microsystems, Inc. at 22⅝; Apple Computer, Inc. at 40¼; Unisys Corp. at 15; and National Semiconductor Corp. at 7¾.

KIM S. NASH

All eyes on IBM's 3090 upgrade plan

BY ROSEMARY HAMILTON
CW STAFF

IBM will not provide a significant performance boost to its aging 3090 line but will instead offer enhancements later this year, users and consultants speculated last week.

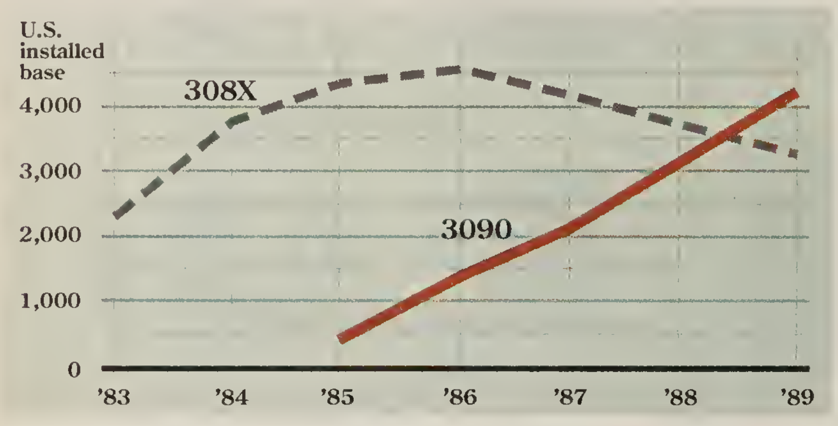
This could lead to mainframe deals that make the more recent contracts look like kid stuff.

If IBM bypasses a traditional kicker — which typically includes a raw performance improvement and other enhancements for an overall jump in the 20% range — and opts for functional improvements, it could run the risk of losing high-end customers, observers said.

What is unclear is how IBM will hold onto its high-end users — some of whom are already beginning to feel a performance crunch — between now and late 1991, the expected due date of the next generation mainframe, known as Summit. During that time frame, the long-awaited high-end mainframe from Hitachi Data Systems Corp. will hit the market.

Parallel trend?

With the next generation, Summit, reportedly in the wings for next year, the U.S. installed base of 3090-class systems may be nearing a peak similar to that experienced by the 3080-class systems



Source: International Data Corp.

CW Chart: John York

One thing is certain: Information systems managers may have the mainframe deal of a lifetime waiting in the wings. The competition will likely be fierce, and it is well-known that IBM will work hard to hang onto its premier customer base.

"It's clear now the 3090 is at the end of its life," said Jim Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn. "Our recommendation is that customers explore the alternatives that are available — Hitachi and Amdahl, leasing extensions and used alternatives."

The expected enhancements, which users speculated will include fiber-optic channel capabilities and other software tuning, could be enough to satisfy some customers until Summit is released. On the other hand, some said that they are already hitting a performance wall.

According to George Sekely, vice-president of computers and communications at Canadian Pacific Ltd. in Toronto, functional improvements may not cut it. "For the top-end user, it never is enough," he said. "They soak up performance like nothing."

> ONE THING is certain: IS managers may have the mainframe deal of a lifetime waiting in the wings. The competition will likely be fierce.

Still others said it depends on how much performance tuning IBM can deliver through software and other features.

"The fiber support for DASD could give you up to five times improvement in throughput," said Doug Underhill, an assistant vice-president of technical services at CSX Technology, the IS services division of CSX Corp.

"That's a loose definition of a kicker. Whatever will help get the work load through quicker is a kicker as far as I'm concerned."

Frank Gens, vice-president of technology assessment at Technology Investment Strategies Corp., said he expects 3090 enhancements later this year and added that the real dilemma for IBM is how far to go in delivering Summit-like features.

If IBM releases only ho-hum 3090 improvements, it will be a tough sell, because most users are already looking toward Summit, Gens said. IBM does have the option of positioning the system as a Summit upgrade to make it more attractive, but that would call for expensive new features, including a new frame and cooling system, that IBM may not be willing to offer just yet.

Mainframe

CONTINUED FROM PAGE 1

competitors, Amdahl Corp. and Hitachi Data Systems — are struggling to adapt.

"I think the game is up," Loane said. "I could buy an Hitachi tomorrow and not feel the pain. The days of that type of account control by force are long gone. There is no such thing as [a vendor] threatening a customer anymore."

In the past, IBM could virtually control accounts by being the only legitimate game in town. As the stories go, IBM locked users into a product line and struck a bargain: In exchange for loyalty, they would receive tremendous handholding, but if they jumped ship, they'd face not only the wrath of IBM but also the risk of going with a lesser vendor.

"The issue they tried to use against us — their staying power — doesn't work anymore," said Ted Springstead, a senior vice-president at Amdahl.

According to Loane, some sales representatives will still try tough tactics: "They say, 'If you don't do this, then you can't have this, this and this.' And I say, 'That's tough. You won't get the sale.' "

Several market factors have been under way for years to bring about this change, including the following:

- With single-digit growth, new IBM mainframe customers are a vanishing breed, so mainframe vendors are increasingly clawing for market share by attempting to steal one another's existing customers.
- Fierce competition has also been helped along by the increasing credibility of mainframe competitors. The uncertainty of the plug-compatible mainframe market has virtually evaporated, and more and more users are willing to go with what had once been a high-risk alternative.
- The growing popularity of smaller, more powerful systems from desktop models to midrange servers. In the worst-case scenario, these systems can replace mainframes. At best, they limit mainframe demand.

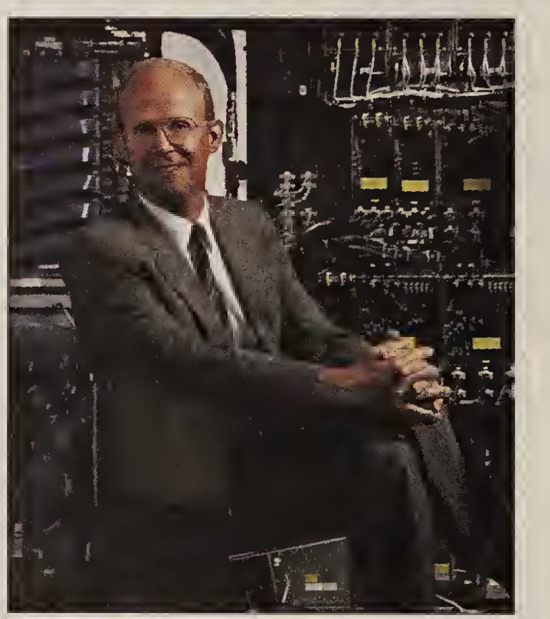
"IBM doesn't want to give up control of its customer base," said Ken Steinback, chairman of Computer Sales International, Inc., a leasing firm in St. Louis. "It's now a market share question. Amdahl has taken away a lot of accounts, and in a sense, that's taking the future away for IBM."

More recently, the expected end of IBM's 3090 line, likely to occur next year, has also helped set the tone for a buyer's market.

Meanwhile, changes inside customer installations have also altered the way mainframe business is done. Harsh economic realities at user companies are forcing IS directors to cut costs in all ways, including new equipment purchases. IS directors are also becoming more savvy at negotiating deals.

"We try to squeeze the hell out of them," said George Sekely, Toronto-based vice-president of computers and communications Canadian Pacific Ltd., of mainframe suppliers.

Hank Hamilton, a senior vice-president at the brokerage firm of Shearson Lehman Hutton, Inc., noted that his industry in particular is in a cost-cutting mode: "In the Wall Street arena, [discounting] is a hot topic because of the trouble of these firms in general. There's a lot of negotiating going on."



> "THE ISSUE [IBM] tried to use against us — their staying power — doesn't work anymore."
>
> TED SPRINGSTEAD
> AMDAHL CORP.

These changes have come together to create this new mainframe market. Several observers equated the new market with the automobile industry, where good deals can be had as long as customers recognize that behind the list price, there is plenty of room for negotiation.

While this shift has been under way for at least three or four years, it seemed to hit a crescendo last year when rumors of widespread discounting buzzed through the industry.

It initially seemed that discounting was a separate phenomenon and a source of heated debate. It now appears that discounting is just one of the more obvious signs that power has moved to the user side.

Interviews with users and observers indicated that discounting has become a fundamental part of doing mainframe business. But these interviews also showed it to be less widespread, and the actual discounts are not likely as steep as some observers have suggested.

"I think this industry hasn't really been exposed to concessions or discounts, so there was a lot of sensitivity to it when it first happened," said Jack Cooper, president of CSX Technology. "We've just never seen these market forces before . . . We're moving away from sets of rules that apply to everyone. These are common business practices in other industries."

Even so, some industry watchers assert that discounting was out of control last year and could likely return to crazy days later this year. The claim to be aware of very deep discounting and suggest that the reason it is not obvious is that vendors, particularly IBM, are keeping customers silent.

It is also a touchy subject when presented to customers. Some users confided that they had received discounts from IBM and its rivals but refused to discuss them on the record. Others only alluded to discounts. But most users contacted spoke more of their fair deals, of which price discounts are only a part.

At Teco Energy Co., Greg Ehlers, vice-president of information services, bought an IBM 3090 J model late last year and said IBM "sharpened their pencil rather than pulling out their price list" to work out a deal.

Ehlers said he looked at third-party options as well, and "that's how we got a fair price."

Like other users, Ehlers would not provide his purchase price, but he said, "I don't think they are as rigid as they used to be. I think they've come a long way in thinking of new and creative ways."

Ehlers said he and IBM together packaged a deal that included two stages of upgrading that will eventually move the shop to a 600J as well as a direct-access storage device upgrade, added main memory and expanded storage. Ehlers also opted to move from a leasing arrangement to a purchase agreement.

"We gave them a bottom-line price and said we didn't care how they priced individual components as long as they met the bottom line," Ehlers said.

Another IS manager, who requested anonymity, said he has received the so-called market basket deals from IBM, in which it rolls in a number of extras for free with a mainframe sale. "They've long offered this," he said. "Once you had to press them for it, but now the marketing requires it."

NEWS SHORTS

Prime adds integration unit

Prime Computer, Inc. announced last week a new systems integration business unit as a separate profit center, the fifth such unit to be established by the minicomputer vendor since last October. The 200 employees assigned to the new unit will offer software and hardware integration, systems consulting, project management and custom systems based on products from Prime and other vendors. The worldwide systems integration market, estimated at $11 billion in 1989, is projected to grow 24% annually to more than $32 billion by 1994, according to Input, a consulting firm in Mountain View, Calif.

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IBM offers AS/400 link

IBM Information Network made available last week a service to link IBM Application System/400s, System/36s and 38s over the value-added network company's Systems Network Architecture backbone. The service, announced in September, does not directly support IBM's Advanced Peer-to-Peer Networking (APPN) protocols that provide dynamic addressing of resources across multiple AS/400 and System/36 nodes, an IBM spokesman said. However, users can register resources with the service, which will then route requests between two geographically distributed APPN networks, he added.

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BBN cuts staff

In an aggressive move to beef up dwindling company profits, Bolt Beranek and Newman, Inc. announced last week that it will be slashing its communications staff by an estimated 10%. The firm indicated that manufacturing operations will also suffer substantial cutbacks. The restructuring will reportedly reduce the total number of employees by approximately 300. The Cambridge, Mass.-based company plans to refocus on its traditional markets, which are large-scale interconnected networks, network software and systems integration activities.

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Paradyne is Clear choice

Network management vendor Clear Communications in Lincolnshire, Ill., said last week that AT&T/Paradyne will provide nationwide support for customers of its Clearview Surveillance System, a decision support system for managing carrier performance on wide-area digital networks.

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Decentralization in focus

American Optical Corp. has joined the ranks of companies with decentralized information systems operations. A spokesman at the company, which employs 5,000 and had revenue of $280 million last year, said the company's IS operations have been spread across four units around the country. Robert W. Piehl, who most recently headed up MIS operations and technical services for the manufacturer of eyeglasses, sunglasses, frames and eyeglass cases, is no longer with the company because of the strategy change, according to a spokesman.

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Aiello heads for Fidelity

First Boston Corp. IS executive Albert Aiello last week concluded his 4½-year stint there and will be moving to Fidelity Investments, Inc. in Boston. Aiello, director of information services operations at First Boston until last Friday, will assume the duties of president of Fidelity Systems Co.

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Net council sets plans

The fledgling Council for Network Management took a baby step toward establishing a methodology for the technical and business management of networks at its second meeting last week in Hartford, Conn. Only a handful of user companies — General Electric Co., Norwest Technical Services, Inc., Bankers Trust and Accord, a not-for-profit insurance agency — were represented, though the council said it is only hoping to attract a core group of about 10 user representatives to distill input from at-large associate members who would like a set of procedures and product criteria for running their networks.

Bid protests no big deal for feds

BY GARY H. ANTHES
CW STAFF

Contrary to widespread public belief, firms selling computer gear to Uncle Sam are not flooding the government with bid protests.

In the second half of fiscal 1988, 87 disgruntled vendors filed 123 protests against federal agencies, which awarded 2,475 contracts for computer goods and services, according to a report from the U.S. General Accounting Office (GAO).

Fifteen complaints were decided for protesters, 22 for the government, and the rest were settled by the parties before a judgment could be made. The highest number of protests filed by a single vendor was 10.

The GAO also said that instances of "fedmail," in which an agency effectively buys off a protester, are not common, as some press reports have suggested.

Only two settlements — totaling $24,873 — in the six-month period involved payments by agencies to vendors. Going back to 1985, the congressional auditors said, $1.5 million had been paid to protesters by 13 agencies or by winning bidders.

Most of the $1.5 million in payoffs were traced to one particularly egregious case in which the U.S. Bureau of the Census paid $1.1 million to three vendors protesting an $80 million computer buy. "The bureau believed it could not afford the time required to resolve the protest," the GAO said. That case led to press reports suggesting that the government's bid protest process had run amok, which led to last week's GAO study.

The study concluded, "Computer companies are not flooding the government with bid protests, and no company routinely lodged protests during the period of the GAO's review. Agencies sometimes settled protests rather than contest them but infrequently by paying protesters money."

Tom Monahan

Terry Miller, president of Great Falls, Va.-based Government Sales Consultants, Inc., said: "Agencies are crying about protests, but their cries are cries of ineptitude because they aren't following procurement regs." Miller said the number of protests is not excessive.

According to Miller, only a few megacontracts get most of the protests and publicity because they are often a matter of life and death for their bidders.

Miller said these omnibus computer buys serve neither the government nor industry well and that smaller awards would be more manageable all around.

Traditionally, vendors have taken their complaints about federal procurements to the procuring agency, to the GAO or, since 1970, to certain federal courts. A 1984 law added another protest forum, the General Services Administration's Board of Contract Appeals (GSBCA), for computer goods and services only.

Cyrus E. Phillips IV, a partner in the Washington, D.C., offices of McGuire, Woods, Battle & Boothe and a former GSBCA judge, said the government won nearly all protests against it when most were heard by GAO.

However, many protests are now going to the GSA appeals board, and the board is finding in favor of vendors about half the time. That has not resulted in a noticeable increase in protests, because they are so expensive and time-consuming, but it has given them much heightened visibility, Phillips said. In any case, the publicity and its attendant scrutiny from Capitol Hill have been helpful, he added.

Exhibitors take AIIM at paper monster

BY ELLIS BOOKER
CW STAFF

CHICAGO — Exhibitors at the Association for Information and Image Management (AIIM) show want to kill a monster — the paper monster that still accounts for 90% of the "information" used by business.

While no one vendor will strike the death blow at this week's AIIM, several plan to announce products and systems to poke the beast:

- Columbus, Ohio-based NCR Corp., which outlined its imaging strategy last December, plans to unveil its first product, the Document Management System (DMS), today. Based on NCR's Open Cooperative Computing client/server architecture, DMS uses Unix-based servers and either DOS or OS/2 workstations as display stations. DMS, scheduled for availability in the fourth quarter, can reportedly recognize handwritten numeric as well as machine-print characters.
- Plexus Software, Inc., based in Santa Clara, Calif., plans to announce today that its image application development tool set, Applications Designer, will be ported to the Sun Microsystems, Inc. Sparcstation 1 reduced instruction set computing platform. Currently, the Plexus tools are available only for personal computers, although the relational database behind Plexus' Extended Data Processing imaging system has been previously available on Scalable Processor Architecture (Sparc) servers. Plexus, Sun and Grumman Infoconversion, a systems integrator (which also acts as an end user), are partners in the project, which should yield a product in 1991, the firms said.
- Bull H. N. Information Systems, Inc. will demonstrate a distributed image storage and retrieval system it hopes to bring to market later this year. Bull's Imageworks Document Management Solution provides filing and retrieval of compound documents — digitized text, graphics and image — in a single relational database. The processing system is based on Bull's DPX/2 Unix server and MS-DOS. Apple Computer, Inc. Macintosh IIs are used as image capture and retrieval workstations.
- Eastman Kodak Co., based in Rochester, N.Y., will unveil a PC system for use with its Kodak KIMS System 5000 imaging system, introduced at last year's AIIM show. Imagelink Desktop for MS-Windows allows a PC to access KIMS with a variety of display options — from monochrome terminals to high-resolution monitors. The software allows users to zoom, rotate, scale and invert an image, and a workflow system can group related images and documents.
- Laseraccess Corp., based in Seattle, will announce what it believes to be the first optical disc-based report storage and retrieval system that is hardware- and software-compatible with IBM mainframe environments. Targeted at IBM MVS shops, the LA1500 system supports CICS, IMS, TSO and 3270 network environments. Access time is reportedly less than one second for on-line retrieval and less than 10 seconds to access data from write once, read many optical discs contained in a Laseraccess Library Unit, an optical disc jukebox. The basic system, at $150,000, is expandable from 2G to 190G bytes of storage.

CA users will see on-line Help

BY ELLIS BOOKER
CW STAFF

CHICAGO — Users confounded by commands in software packages from Computer Associates International, Inc. (CA) soon will be able to hit a key and get help in the form of an on-line manual, a soothing voice or even a pop-up window containing a videotaped instructor.

Last week at the eighth annual Computer-Based Training Conference and Exhibition, CA introduced CA-Adroit/II, an interactive computer-based training (CBT) development system that is scheduled to show up in some of CA's own software products this summer as a multimedia Help option.

CA-Adroit system *should calm CA users' nerves*

The product is a significantly expanded version of Adroit, the 8-year-old CBT authoring system for personal computers that CA took over when it acquired Applied Data Research, Inc. (ADR) in October 1988.

In addition to new support for compact disc/read-only memory (CD-ROM) and laser disc drives — which provide text, full-motion video and digital audio playback — ADR's original PC-based authoring system has been expanded to include support for IBM's System Applications Architecture. This allows a user to access Help or run a training simulation without ending the host session.

CA officials also showed how Adroit/II has been applied to CA's own mainframe software products. This summer, the so-called On-line Consultant will be available as an option on CA's ACF-2 security system and its CA-7 scheduling system, said Stephen E. McManus, assistant vice-president of marketing at CA's Information and Systems Products Group.

Other CA products are slated to get the multimedia Help option, according to McManus, who added that CA eventually plans to distribute many of its documentation manuals in a CD-ROM format.

Although pricing for the on-line Help option has not been set, it will likely mirror CA's pricing mechanism for graphics options, company officials said. Those graphics options are 6% to 8% of the total software price.

Hardware requirements for Adroit/II include an IBM Personal System/2 Model 60 or above with a 3270 emulation card, a CD-ROM drive and a videodisc player.

Lotus

FROM PAGE 1

ing any impact on 3Com, he claimed his company has pushed to become a network systems integrator while Novell has moved increasingly toward software manufacturing.

David Mahoney, president and chief executive officer of Banyan Systems, Inc., also expressed little concern about the impact on his company's local-area network business.

Lotus, Mahoney said, gains "the credibility of Novell's expertise in work-group networking and connectivity."

Applications software vendors had more varied reactions. Lotus is now "capable of making a serious run at Microsoft," said Fred Gibbons, president of Software Publishing Corp.

Philippe Kahn, chairman of Borland International, took a negative stance, saying, "The idea that this somehow makes Netware a more viable [network] operating system is ridiculous."

The estimated $1.5 billion merger, which is supposed to conclude in July, will leave Lotus shareholders owning 51% of the combined company. Novell will operate as a wholly owned subsidiary and become a fifth Lotus division. Lotus Chairman Jim Manzi will serve as chairman of a combined board of directors; Novell President Raymond Noorda will become vice-chairman and continue as Novell's CEO.

Initial stock market reaction was somewhat negative. According to Mary McCaffrey, an analyst at C. J. Laurence, heavy trading Friday of Novell stock — more than 38 million shares — indicated some displeasure. On Friday, Novell closed down more than $4, while Lotus slipped $2.

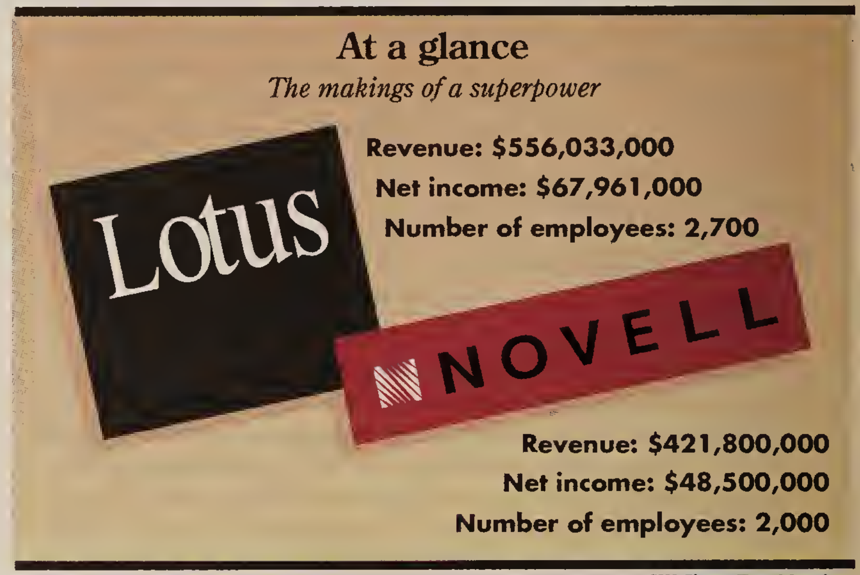
With the Novell buyout and a development relationship with Wordperfect Corp., Lotus is aligned with two other market leaders, each claiming an estimated 70% market share.

Despite the challenge this poses to Microsoft, there is also the potential that parts of Microsoft's business could benefit, particularly in the areas of OS/2 and client/server support.

Netware is likely to become a tougher competitor to Microsoft's OS/2 LAN Manager, said Robert Epstein, executive vice-president at Sybase, Inc., which is owned in part by Lotus and allied with Microsoft on the SQL Server product for personal computer LANs. On the other hand, he said, as Lotus and Novell combine on OS/2 products, it will spur demand for Microsoft's operating system.

Beyond that, industry analysts said the two face horrendous cultural differences. Lotus Executive Vice-President Frank King operates on the rule that you release no product before its time. Novell has a reputation for announcing products while the grapes are still on the vine. They must also sort through several conflicting strategic alliances.

Staff members Joanie M. Wexler and Charles von Simson contributed to this report.



CW Chart: Tom Monahan

Waiting and watching

BY RICHARD PASTORE
CW STAFF

User reaction to the proposed Lotus Development Corp./Novell, Inc. merger ranged from astonishment to indifference, but most of those contacted said they look forward to the potential for improved Lotus networking.

"They both hold leadership positions in two fields, so the integration of their products will be dramatic," said Eric Gilbertson, manager of MIS at Uniroyal-Goodrich Tire Co. in Eau Claire, Wis.

"With a networked common package from Lotus and Novell, the ease of transferring data with integrity will be drastically increased vs. rekeying," Gilbertson said.

Other users added their sentiments that the merger can only improve Lotus' networking capability. "If Lotus spends more time moving to a networking type of software, it would be a great help," said a PC manager at a Fortune 500 health care products supplier.

Some MIS managers were perplexed by the proposed merger. "It's almost mind-boggling," said Joseph Vincent, director of technology planning at Humana, Inc. in Louisville, Ky. "The integration of the two product lines is hard to see; there's almost an exclusivity between them."

One IS manager at a Fortune 500 company that recently downsized mainframe operations to Novell-based LANs expressed outright disappointment at the prospect of Lotus directing Novell strategies. Nevertheless, he philosophized that "it could have been worse if Ashton-Tate bought" Novell.

Senior Editor Elisabeth Horwitt contributed to this report.

3Com

FROM PAGE 1

turned over all operating responsibilities to Oshman in May. He was to have stayed on as an advisor to Oshman until September.

Despite the press release and a confirmation from an Echelon spokesman, the executives involved strongly denied the reported merger. Krause and Oshman repeatedly insisted that 3Com had only tried to recruit Oshman as a director.

However, the release quotes Krause as saying, "The opportunity to merge with Echelon and sign up Ken Oshman to succeed me as 3Com's CEO was just too good to pass up."

The deal, which would have required a merger via a stock swap between 3Com and Echelon, a tiny, Los Gatos, Calif.-based network-management firm, fell through at the eleventh hour. Oshman is chairman and CEO of Echelon, in which 3Com holds less than a 1% stake, 3Com founder Robert Metcalfe said.

Late last week, 3Com abruptly called off what had been teased as a major press conference with no explanation. According to a source close to both companies, Oshman backed out for unknown reasons.

Although conceding that if Oshman were not committed to Echelon, "there is no question" that 3Com would be interested in him, Krause called the reported merger "pretty farfetched . . . something out of fiction."

When told that Echelon spokesman Barry Haaser had confirmed the aborted merger — at least 3Com's fourth — Oshman angrily called him a liar before denying that Haaser had even made the statements.

"We never had a deal. We never had a proposed deal. We never approximately had a deal with 3Com," Oshman insisted.

Haaser, however, said 3Com approached Oshman about a possible merger in the "February time frame." He said it was Oshman, as opposed to Echelon, that 3Com coveted.

Despite these confirmations, Krause and Oshman insisted that 3Com only tried to recruit Oshman as a director. A canceled press release — dated March 29 and on 3Com letterhead — indicates otherwise. It was headlined "3Com, Echelon to merge; Oshman to become president and CEO."

It is unclear whether the bid for Oshman undermines the trio of senior executives now running the company.

Just three months ago, 3Com had set up a triumvirate of executive vice-presidents — Eric Benhamou, Leslie Denend and Robert Finocchio Jr. — to take over control of daily operations from Krause.

It had been expected that one of the three would be appointed to succeed Krause as president within 12 to 18 months. It now appears that 3Com may not want to wait that long.

Sonet speeds to reach users

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — The Synchronous Optical Network (Sonet) standard could put high-speed networking applications such as videoconferencing, image transfer and LAN-to-LAN interconnections within users' budgets — at least by the turn of the century.

Originally conceived as a standard for carriers' fiber-optic multiplexers, Sonet is emerging as a vehicle for delivering affordable bandwidth of 100M bit/sec. or more to the user's desktop, speakers said at a Broadband/Sonet conference put on last week by The Yankee Group.

The catch-22 that emerged at the conference, however, was that carriers plan to wait for market demand to justify full deployment of the standard, while many users may not come up with applications that demand Sonet's bandwidth until it is widely and cheaply available.

Demand exists

A potential demand for Sonet definitely exists, according to The Yankee Group Director Howard Anderson. Leading-edge companies such as Ford Motor Co., Metropolitan Life Insurance Co. and Allied Signal, Inc. are already eyeing Sonet as a way to support applications such as LAN-to-LAN interconnection and "idea flow" through videoconferencing and sharing of documents and images, Anderson said.

Boeing Computer Services, Inc. has already determined that Sonet "will be the preferred digital transport for interconnects in three years," supporting a wide variety of strategic applications, said Everett Rigsbee III, the Boeing Co. division's senior network systems architect.

Boeing is counting on high-bandwidth Sonet services to interconnect distributed campus local-area networks utilizing the 100M bit/sec. Fiber-Distributed Data Interface and to make very large databases of aircraft designs accessible to computer-aided design and manufacturing (CAD/CAM) workstations throughout the corporation, Rigsbee said.

"T1 is too slow for CAD/CAM links. We have about 500 T1 links now interconnecting campuses, and that strategy is running out of gas," he added.

Noting that there are currently only about 25 businesses with enough intersite communications traffic to justify Sonet, Anderson said that users tend to be "skeptical but not cynical" about the standard. And the skeptics apparently include businesses planning applications requiring the kind of bandwidth Sonet offers.

One such company, J.C. Penney Company, Inc., is interested in Sonet as a way to provide "immediate access to timely data and images" across the corporation's soon-to-be 1,000 stores, Communications Development Manager Al Ladwig said.

One application J.C. Penney hopes to implement "in some form" within the next two years would enable merchandisers to bring up different views of the latest fashion designs purchased by corporate buyers and then send their orders back to corporate headquarters on the same LAN workstation, Ladwig said.

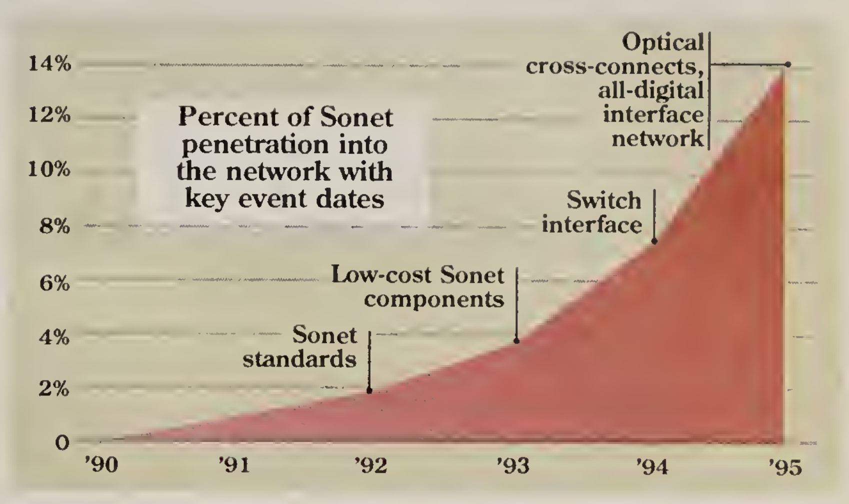
But while J. C. Penney definitely has "high-bandwidth applications that could be satisfied by Sonet," Ladwig said, the standard is "too far out to evaluate [as a corporate direction] right now; I doubt that it is as close as two years away."

Other sources agreed. Local-exchange carriers will not begin to provide Sonet-based applications on customers' premises until 1992, and by 1997, only 40% of all carriers' circuits will be provided via the standard, said a recent report by Austin, Texas-based research company Technology Futures, Inc.

Representatives from U.S. Sprint Communications Co. and MCI Communications Corp. said that their companies plan to deploy Sonet on all new facilities beginning next year but that conversion of existing central offices would depend on user demand. An AT&T spokesman refused to give any Sonet deployment time frame.

Optical networking

Sonet penetration is projected to rise as anticipated technological milestones are reached



Source: Technology Futures, Inc.

CW Chart: John York

Multiprocessor 486 box unveiled by Encore

BY MAURA J. HARRINGTON
CW STAFF

Encore Computer Corp. last week introduced the Encore 90 family of multiprocessor systems, designed to allow co-resident operating systems to run concurrently.

The Encore 91 system, first in the 90 product line, was designed to simultaneously run Version 3.2 of Umax V, Encore's version of AT&T's Unix System V, with MicroMPX, the company's proprietary on-line multiprocessing operating system kernel, the company said. The Encore 91 comes in both two- and four-processor models.

The ability to run multiple operating systems can also be applied to other guest operating systems, according to William Avery, Encore's vice-president and general manager of product operations.

"What we've done is we've found a way to bridge proprietary environments with our Unix-based open sytems environment," Avery said.

Encore's strategy is to build systems based on a multiprocessing environment because that is where the industry is moving, Avery said. Users need a way to bridge their proprietary system with a standards-based operating system, such as Unix, he added.

"It is the software capabilities that we think are important here because that is where the future competition lies in the multiprocessing systems arena," Avery said. The real-time capabilities running on Unix are key elements of the strategy, Avery added.

Due out by the fourth quarter of this year, the Encore 91 products feature 16M bytes of memory (expandable to 272M bytes), Motorola, Inc.'s 32-bit reduced instruction set computing processor and two small computer systems interface channels, the company said. Pricing varies depending on configuration.

SAS package no longer techie tool

Latest version features more ease of operation for end users

BY SALLY CUSACK
CW STAFF

NASHVILLE — Amidst a crush of 3,500 enthusiastic users and with an eye on a new audience, SAS Institute, Inc. in Cary, N.C., unleashed Version 6.06 of the SAS System analysis package last week.

"Overall, this release repositions the package, taking it from a techie tool to a more application development-type environment for end users," said Bill McNee, a software analyst at Gartner Group, Inc., a Stamford, Conn.-based market research company.

Unveiled at last week's 15th annual SAS Users Group International conference, Version 6.06 was designed for use by both novice and experienced users and is billed as a broad-based applications package. The software is written in C and runs on both IBM MVS and CMS and Digital Equipment Corp. VMS platforms.

New features

Features now include menu-driven interfaces, cut-and-paste capabilities, embedded SQL access and a database engine that allows users to read and write data from a variety of files without converting them into SAS data files, the vendor said.

"The access to database systems will allow us to begin building a distributed processing environment," noted Robert Lohr, a programmer/analyst at the U.S. Census Bureau in Washington, D.C. Stressing that it was just his personal opinion, he also added that he thought the package was a great improvement over the previous release.

"The display manager is much better — more user-friendly," he said. "Now we can reset the keys and customize it. The end user shouldn't have to care what format his data is in or what hardware it's on. The software runs on all the platforms we use, so it gives our users a consistent, familiar interface."

Version 6.06 also offers data compression and indexing capabilities and allows users to customize and tailor reports. It is aimed at a wide variety of applications, including survey research, clinical research, data management, CPU performance evaluation, presentations and graphics, and it can also be used as an access program.

"The definition is elusive," said Jim Goodnight, president and founder of the company. SAS Institute, incorporated in 1976, has over two million users worldwide and is still privately held. The company generated revenue of $205 million last year, Goodnight said.

A version of the SAS System for personal computers and AT&T Unix System V environments was released in 1988. An OS/2 version, offering Systems Application Architecture and CUA compliance, is scheduled to come out this summer.

Release 6.06 of the SAS System is licensed from $4,000 to $19,000 for IBM mainframes and starts at $1,900 for a base component running in the DEC VMS environment.

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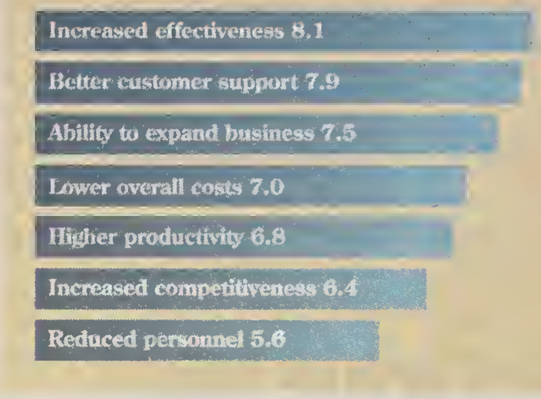
TRENDS

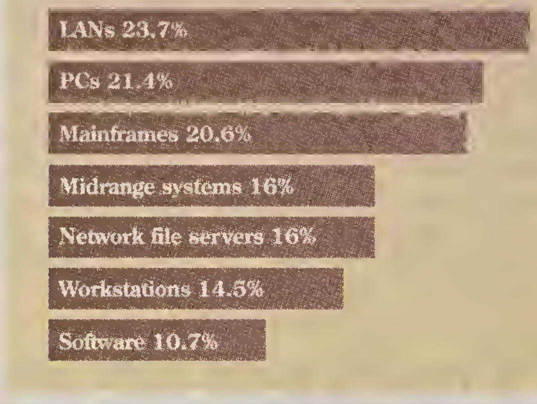
Utilities are prioritizing benefits sought from IS expenditures with a focus on efficiency and support.



Benefits desired from IS

Respondent base of 131
Rating: 1=Not important, 10=Very important

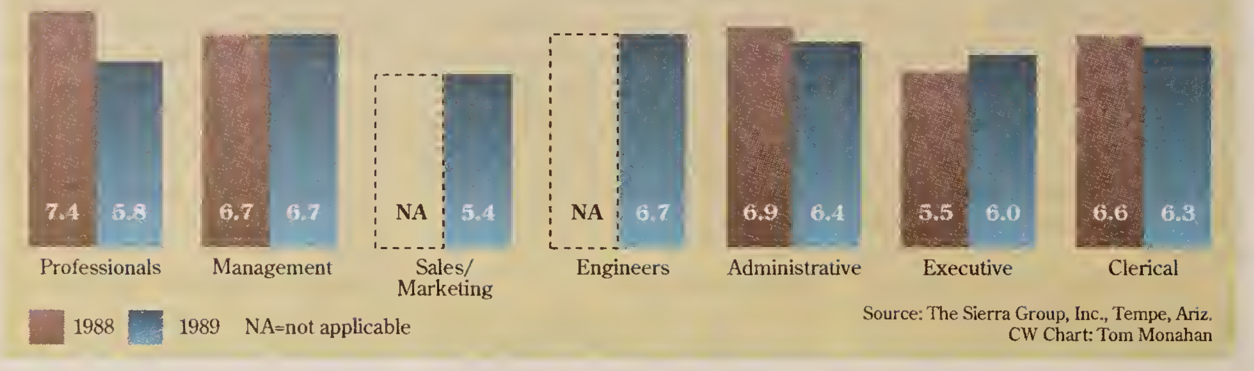
Topping the benefits on the IS wish list is increased effectiveness, followed by what is probably No. 1 in the eyes of the public — better customer support



First budgets to be cut

Percent of respondents; base of 131
Multiple responses allowed

If a budget cut became necessary, what would be the first technology affected? Over 20% surveyed said PCs and LANs, with software and workstations emerging as the most indispensable



Occupations targeted for productivity enhancements through IS

Respondent base of 131
Rating: 1=Unlikely, 10=Most likely

Professionals, who had been the predominant focal point for enhancements in the past, have dropped to fifth place on the priority list and have been replaced by management and engineers

Source: The Sierra Group, Inc., Tempe, Ariz.
CW Chart: Tom Monahan

NEXT WEEK

When **Al Hyland,** director of worldwide systems at Polaroid Corp., hired consultants to assess the firm's outsourcing activities, he was looking for "side benefits" as well. Like Hyland, many IS executives say that what happens outside the bounds of a specific project is often the most valuable aspect of working with consultants. See Executive Report.

John Owens

Outsourcing is not just a savings plan, says John Oltman, Andersen Consulting's worldwide integration chief. Companies that go beyond the obvious can get even better yields, including deeper market knowledge and expanded international presence. To find out how to make outsourcing work to maximum advantage, read the In Depth section.

INSIDE LINES

Actuarily speaking

A major insurance company will announce an unusual outsourcing agreement later this month, turning over its 100-member applications development staff to the outsourcing vendor but keeping its data center operations at home. The finalists bidding for the work are Canada's SHL Systemhouse, Andersen Consulting and an unnamed vendor.

Just stay out of Red Square

Retired Aetna information systems chief Irv Sitkin, who has led two delegations of IS professionals to mainland China, is organizing a similar trip next year to the Soviet Union and other Eastern Bloc countries. Sitkin plans to visit fellow computer professionals in Moscow, Kiev, Budapest and Prague in the summer of 1991.

With partners like this . . .

AIX Release 3 was up and running at IBM's booth at last week's CASExpo, but some participating software vendors demonstrated their CASE tools on RTs running the older version of AIX. For software programs such as Atherton Technology's Software Backplane, which has to interface at a low level with the operating system, AIX Release 3 is not quite up to snuff. According to the Atherton rep, they are waiting for better support of Sun's Network File System.

Everyone loves a boy in uniform

According to two sources close to the case, U.S. Justice Department officials cannot agree on what kind of sentence to recommend for Robert Morris, scheduled for sentencing May 4 for planting a worm in a computer network. If officials base their recommendation on federal uniform sentencing guidelines, they will suggest that Morris be given 21 to 27 months in jail. But the Justice Department is divided into two camps: one advocating a lower and the other a higher sentence than the guidelines suggest.

Graphic interface

If you have any lingering doubts that Sun Microsystems intends to deep-six its two other product lines in favor of its best-selling Sparcstation — "getting all our wood behind one arrowhead," as President Scott McNealy calls it — take a trip down to company headquarters where an enormous arrow protrudes from the fifth floor of one of its main buildings.

They does do DOS (repeat it fast)

The latest dope on the forthcoming new DOS is that IBM is actually working on *two* new DOSs. One is the fabled DOS 5.0, which we have already covered in this space. Another is a response to the users who railed against the leap between DOS 3.1 and 4.0. So many people were upset about the size of DOS 4.0, our sources say, that IBM reportedly plans to do a little backpedaling. It will respond by filling in the gap with DOS 3.5 — smaller and less function-rich than 4.0 — to provide users with a more gradual growth path.

Twilight Zone annals

A Leading Edge Products, Inc. listing does not name John Sullivan, who had left a marketing post with Leading Edge and then came back as chief operating officer during the company's reorganization. Last week, Sullivan said he is still the chief operating officer, but that "we are negotiating and looking at some possible changes." A company spokeswoman said Sullivan is no longer the COO but is currently working on special marketing projects for Chief Executive Officer Al Agbay. Hmmmm!

And these guys expect to be credible in the future? Last week, Bill Krause and Ken Oshman flat-out denied 3Com wanted to scoop up Oshman's company; so how do they explain the press release that was prepared stating just that? Also, last Monday, Novell's Darrell Miller debunked Wall Street rumblings that the company would be acquired within a year; maybe he's just not on the in-team? When you catch your vendor red-handed (or red-faced), give us a holler via MCI Mail (address: COMPUTERWORLD*), fax (508-875-8931) or by calling News Editor Pete Bartolik at 800-343-6474.*

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